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Editorial

We are pleased to record that Surgeon Rear-Admiral D P Gurd, CB, OHS, MD, MCh, FRCS(Eng), FRACS, DOMS has been invited to receive the honorary degree of Doctor of Science of the Queen's University of Belfast in recognition of his Services to Medicine. The Graduation Ceremony will be on July 8, 1969. Our sincere congratulations go to Surgeon Rear-Admiral Gurd on being singled out for this unique recognition.

Admiral Gurd, who retires at the end of April, 1969, said — in a letter to the Editors —

'I leave the Navy with mixed feelings. It is entirely different in all respects apart from the uniform to the Navy I joined in 1934. The aspect that has impressed is the standard of medical competence which is now extremely high. The Empire has gone and all the very romantic stations with it. It was a great joy to serve in the China gunboats and see the Union Jack flying all over the world and to feel as safe in Canton as in Manchester — or safer. Now we must offer a medical 'corps elite' to compensate for the romantic commissions.'

In our last editorial we expressed concern that when Admiral Gurd left the Service we would be left with two SRA's only. Happily this is not so and we are able to offer our congratulations and best wishes to the three Surgeon Captains who will this year be promoted to Flag rank, namely N. S. Hepburn, R. P. Phillips and J. Watt.

THE NAVAL MEDICAL SYMPOSIUM

This has now been arranged for Thursday afternoon, September 18, and all day Friday, 19, in the Royal College of Physicians. There will be a reception on the Thursday evening and the Royal Navy Medical Club dinner is on the Friday. A provisional programme will be prepared and circulated early in March.

PAPERS IN THIS ISSUE

The bulk of this issue contains a series of papers on Modern Trends in Nervous Diseases and we are pleased to publish material of such high academic calibre.

We are however equally glad to include those of Historical interest and others which suggest that the Navy still offers medical and dental officers opportunity for adventure and experience. These we always welcome.

REFERENCES

Our biggest problem in compiling the Journal is to ensure that serious papers include adequate references as outlined in the advice to subscribers which is printed inside the back page of the Journal's cover. The Secretarial staff spend many heart-breaking hours in efforts to ensure that authors do produce adequate and complete lists of references. This should be the author's responsibility and even now we still publish papers which give names of workers in the appropriate fields and yet omit the formal references. The importance of accurate referencing cannot be too greatly stressed. It is assumed that writers of papers expect their readers to take an interest in their publications and there is nothing more aggravating than for an enthusiastic colleague being unable to trace previous work in a particular subject. Prompt publication of the Journal which is our aim is invariably a race against time and in the majority of cases where there is delay in publication this is solely due to time spent often by members of our own staff in ferreting out references for others. We are always very reluctant to turn down or delay high quality papers but feel very strongly that it is the responsibility of the editors to ensure that the conventional practices of academic publication are fulfilled. Thus we make a strong and heart felt plea to all potential authors to ensure that any papers submitted contain a full, accurate and personally checked list of references.

Symposium on Modern Trends in Nervous Diseases and Gastro Intestinal Disorders

Held at the Royal Naval Hospital Haslar on October 23 and 24 1968

As mentioned in the editorial of the last RN Medical Journal the major part of the first day's Proceedings of the above Symposium is reproduced in the following pages and the lectures of the participants are printed in full The second day's Proceedings are to be published in the Summer 1969 edition

Day 1 of this Symposium was devoted to the subject of 'Modern trends in Nervous Diseases and Surgeon Rear Admiral E B Bradbury CB QHP MB DMRD, Medical Officer-in-Charge, Royal Naval Hospital Haslar, welcomed the participants and approximately 140 members of the audience composed of Civilian Consultants, General Practitioners and members of the three Services Following this a short introductory speech was given by the Medical Director General (Naval) Surgeon Vice-Admiral E D Caldwell CB QHP MD FRCP (Ed and Lond) (KBE in the New Year's Honours List) The other participants on Day 1 were as follows

Mr Jason G Brice MB FRCS Neurosurgeon Regional Neurological Centre, Southampton General Hospital and Wessex Regional Hospital Board

Dr James W D Bull MA MD FRCP FFR Director of Radiology National Hospital for Nervous Diseases Queen Square Consultant Neuro Radiologist to the Royal Navy

Mr John S Garfield MB MChir, FRCS MRCP Neurosurgeon, Regional Neurological Centre Southampton General Hospital and Wessex Regional Hospital Board

Dr William Gooddy MD FRCP Fellow of University College London Physician National Hospital for Nervous Diseases Queen Square Neurologist University College Hospital Consultant Neurologist to the Royal Navy

Dr R A Henson MD FRCP Physician i/c Department of Neurology London Hospital Physician National Hospital for Nervous Diseases Queen Square

Dr R E Kelly MD FRCP Dean of the Institute of Neurology Physician i/c Department of Neurology St Thomas Hospital Physician Maida Vale Hospital for Nervous Diseases

Dr R W Ross Russell, DM, MA FRCP Physician Department of Neurology St Thomas' Hospital Physician National Hospital for Nervous Diseases Queen Square

Unfortunately, lack of space does not permit the publication of the tape recording of the panel discussions which followed the morning and afternoon sessions on each of the two days

POLYNEURITIS

By Dr William Gooddy

Tradition and historical association have enabled the term polyneuritis to be retained as the title of this lecture, though the nerves are not inflamed — and the more scientific polyneuropathy derived from a better neuropathological understanding of the problem must gradually replace the older term. Peripheral neuropathy omits the implication that all the peripheral nerves are affected, and is slightly unsatisfactory.

Polyneuritis is a problem of great importance for the physician and sometimes for the surgeon for the condition appears in a wide variety of forms, may be insidious in onset in a manner suggestive of cancer, may be associated with acute episodes of, for example, mental disturbances of the greatest severity or of severe headache or of abdominal pain. It may be the pointer to the onset of fresh disasters of the pharmaceutical or industrial chemistry industries (thalidomide, acrylamide) or to the imminence of an epidemic outburst (North Africa cooking/fuel oil outbreak).

It has an astonishingly wide range of causes. It is almost always preventable. It has a first rate prognosis if full facilities for diagnosis and management are available. Not least it provides a model for investigating and understanding the metabolism of nervous tissues in general. For example it might provide a clue to progressive muscular atrophy (MND) and it does illuminate some features of the biochemistry of mental disease and also of cancer. Its association with anaemia by Addison was the first step in understanding vitamin B12 deficiency.

It will be seen that these introductory remarks enable one to take a general view of a symptom-complex allied to neuro-biochemical damage. Exactly what happens when many, perhaps all of the peripheral neurones, motor, sensory and autonomic are affected is being considered. Traditionally the notion of polyneuritis is only of tingling and numbness of the extremities and some foot drop with a formidable list of causes which always escape the memory — alcohol and beri-beri are well known but the cerebrum, cerebellum and cranial nerves may be affected in the same illness. The trunk and respiratory muscles may be dangerously affected with the threat of death in severe cases. When the autonomic system is disturbed gross tachycardia is a serious feature and autonomic derangement may be the cause of the occasional case of sudden death. Such a disaster is notorious in the so-called 'acute infective polyneuritis' when the patient may fall back dead on his pillows after some mild exertion.

There is something similar in vitamin C deficiency, as can be read in Anson's 1741 account of his voyage round the world ('all the fruit juices I have consumed on my journey have probably protected me') but goes on ' many of our people, on their being the least moved (though it was only from one part of the ship

to another, and that too in their hammocks have immediately expired others who have confided in their seeming strength, and have resolved to get out of their hammocks, have died before they could well reach the deck nor was it an uncommon thing for those who were able to walk the deck, and to do some kind of duty to drop down dead in an instant, on any endeavours to act with their utmost effort'

The condition has been described since the eighteenth century Graves described an epidemic in Paris in 1828 Todd was the first to suggest, in 1854 that the ends of the nerves underwent degeneration 'Dying back', a process later demonstrated by Dumenil in 1864 Landry described ascending paralysis in 1859 Grainger Stewart gave the condition the name multiple symmetrical peripheral neuritis in 1881 Korsakow of Odessa described the psychosis named after him as integral with polyneuritis in 1889 Some of the finest descriptions are to be found in turn of the century writers in particular Gowers (1893) and Oppenheim (1911)

What has been learned since then? It is obvious that the general clinical picture has not greatly changed

(1) It has been realised that polyneuritis is not a disease in itself

(2) A host of causes have been found which produce their effects by biochemical damage to the nervous system and perhaps also to other systems (as in Addisonian anaemia or diabetes)

(3) It is possible to make an earlier diagnosis sometimes before weakness, wasting and sensory loss become obvious and crippling either from greater clinical awareness or from associated symptoms or by laboratory tests nowadays of a formidable sophistication Yet about 40-50 per cent of the cases are undiagnosed aetiologically and as fast as one copes with a known cause one adds new, often mysterious causes from new agents

(4) Fortunately very many more lives are saved nowadays if one is alert to the diagnosis and always keeps ahead of respiratory failure

MAIN CLINICAL FEATURES OF POLYNEURITIS

The history is often vague consisting of a variety of apparently unrelated complaints such as lassitude insomnia, shortness of breath depression loss of weight and appetite or inability to cope' The patient may decline into a dementia and have no complaints, with the total neglect of his neuropathy Such symptoms may have bothered the family doctor for months before frankly neuritic complaints arise At the overt neuropathic stage the patient complains of a mixture of tingling and numbness almost always first of the feet and later — hours, days, months — of the hands Later still the lips and tongue may be affected and latest of all the trunk, respiration swallowing and eye movements An exception to this

order is seen in diphtheritic polyneuropathy when as Walshe pointed out in 1918 swallowing and accommodation may be early affected on account of the proximity of the infection

One should never allow oneself to diagnose polyneuritis if the condition is monoplegic or hemiplegic A general cause produces a general symptomatology A possible reason for the legs being so often affected before the arms is that the nerves of the legs are about 25 cm longer than those of the arms If the arms are affected first great care should be taken to exclude all the other causes of arm weakness and sensory loss, such as multiple sclerosis trauma, tumour spondylosis syringomyelia congenital and acquired lesions of the cervical canal and foramen magnum and syphilis

As the disease progresses the patient notices weakness of peripheral muscle groups without fasciculations and eventually with wasting The feet and hands become insensitive There are bursts of painfulness in the parts affected There are perversions of sensation of false coldness or heat and burning The feet and hands feel swollen or bursting or wrapped in bandages Walking is as if on foam rubber and feeling by touch as if through gloves The motor and sensory defects combine to produce clumsiness at first in small manipulations with keys and coins later in feeding and walking A characteristic feature of alcoholic polyneuritis is very great pain in the calf muscles especially at night as if the flesh is being torn off the bones How much this symptom is due to nerve disease or to muscle damage as well it is hard to say

In most cases the disease ceases to spread centrally beyond the knees and elbows but sometimes it spreads to affect proximal limb muscles the abdominal muscles the respiratory muscles and the cranial nerves Loss of sphincter control is rare, but is known to occur in subacute combined degeneration (vitamin B 12 deficiency) where the spinal cord is also affected It is curious to note that the author has seen cases with almost total muscular helplessness on the verge of respiratory collapse still labelled as 'hysterics'

There is the possibility of a totally different presentation which is of interest for the psychiatrist Peripheral symptoms are negligible and the patient is brought by relatives because of poor memory lack of insight hallucinations (visual) delusions (auditory), violent behaviour, or possibly fits It is this kind of problem which affects the long-distance lone sailor whose limb symptoms are attributed to the boat's motion In such cases the deficiency is likely to be due to lack of vitamins rather than excess of alcohol purely for reasons of stowage

EXAMINATION

The physical state embodies many features of simple but classical neurological reactions Polyneuritis should serve as an excellent model for students But even before the characteristic local signs can be elicited the diagnosis may be suggested by the patient's appearance and behaviour He or she may muddle the time of

appointment or cancel it and renew it, or otherwise waste a good deal of everyone's time. The patient may arrive very late or unduly early and fall asleep while waiting in a haze of alcohol or barbiturates. Only the older physicians will note an acidotic or uraemic breath or sugar spots on the shoes, and perhaps only the younger ones the royal purple stains of porphyrins on the underclothes. In the motor system tone and power will be reduced, at first peripherally. Muscle bulk will be evenly diminished, fine co-ordination will be poor. Fasciculations are absent. The tendon reflexes will be reduced or absent first at the ankles and wrists, and later at the knees and elbows. The plantar response will be flexor or absent, and if an extensor plantar response is found an explanation *additional* to polyneuritis must be found. (For example, the absent reflexes and extensors in subacute combined degeneration are explained by peripheral neuropathy *plus* spinal cord damage, both due to the same deficiency.)

Though there are very rarely pure motor neuropathies, sensory testing should virtually always reveal some deficit, and it is usually obvious (though one has to remember that subjective changes may precede objective findings). Both superficial and deep sensibility are affected in the thermal and pain group as well as in the tactile and postural group. The loss of sensibility diminishes as the test object passes centrally, and the classical glove and stocking (half hose, socks) pattern is often found. Where no clear change is found, a pin drawn up the limb may enable the patient to detect an increase in sensation as the pin moves up. In the author's experience the tuning fork is an especially valuable test instrument, especially if the fork is used quantitatively instead of a mere qualitative 'can you feel it or not' test.

The clinical picture may be considered more or less the same for all forms of polyneuropathy. It is not possible in this article to specify features particular to certain forms. Once the condition has been found, it is necessary to pass to the isolation of the pathology and aetiology.

PATHOLOGY

The current fashion is to separate neuropathies into two forms, one in which there is dying back of the nerves (reminiscent of Todd's suggestion of 1854) and the other where there is segmental demyelination. Quite some time has been spent trying to get these categories clear without much success because different authorities have supplied conflicting allocations to the dying and demyelinating groups.

The late Godwin Greenfield (1958) made a useful classification as shown below.

FIGURE 1

CLASSIFICATION OF FORMS OF PERIPHERAL NEUROPATHY

1 *Parenchymatous*
- (a) Primary neuronal degeneration and atrophy
- (a) Disturbance of pyruvate oxidation in neurone
  Beri-beri and vitamin deficiency in alcoholism, arsenical poisoning, etc.
- (b) Less well understood disorders of metabolism of neurone
  Neuropathies in carcinoma, poisoning by TOCP, streptomycin, stilbamidin

(a) Hereditary neuropathies due to dystrophy or failure of nutrition of neurone.
Peroneal atrophy (Charcot Marie-Tooth) Roussy Levy syndrome. Hereditary sensory anmonophy (Denny-Brown)

(b) Segmental demyelinative neuropathy
(Toxins or poisons primarily affecting sheath of Schwann and myelin)
Diphtheria Lead (Acute porphyria.)

II Interstitial

(1) Allergic and post infectious neuropathies (causing oedema with or without inflammation of nerve roots ganglia or peripheral nerves)
Acute infective, mumps Allergic neuritis Shoulder girdle neuropathy (Neuralgic amyotrophy)

(2) Metabolic disorders producing interstitial neuropathy (Hereditary or of unknown aetiology)
Hereditary hypertrophic neuritis (Dejerine-Sottas). Neuropathy in primary amyloidosis

(3) Interstitial inflammation of nerves
Pyogenic. Leprosy Trypanosomiasis.

III Vascular and ischaemic
Panarteritis nodosa Buerger's disease (Diabetic)

IV Traumatic and mechanical (including thermal)

(1) Acute trauma

(2) Subacute and repeated trauma or pressure
Crutch palsy Ulnar groove neuropathy Carpal tunnel syndrome Pregnancy neuropathy
Some forms of sciatica Root lesions due to degeneration of intervertebral discs.

(3) Cold
Immersion foot.

The point which emerges from this detailed list is that there may be degeneration of the neuronal cell for various biochemical and toxic reasons and *there may also be* degeneration of the Schwann cells which produces segmental demyelination and this double possibility may explain the occasional conflict cause

As this article is chiefly for the practising clinician a current list of causes of polyneuropathy is appended

FIGURE 2

CAUSES OF POLYNEURITIS

1	Unknown	
2	Infections —	
	(a) Intrinsic	Acute Infective (Guillain Barré)
	(b) Neurotropic	Diphtheria
	(c) Complication	Acute specific fevers Brucellosis
		Septicaemia
		Typhoid paratyphoid
		Syphilis
		Tuberculosis and sarcoidosis
		Typhus malaria smallpox dysentery
3	Poisons —	
	(a) Metals	Arsenic Antimony Mercury Copper Gold Phosphorus Bismuth (Lead)
	(b) Organic	CO Carbon bisulphide Dinitrobenzol Aniline Tetrachlorethane, Triorthocresyl phosphate Ergot Sera Aaryl amide Alcohol
	(c) Drugs	Antibiotics steroids, sulphonamides, psychotropic urinary antisepsis etc

4	Deficiency —	
	(a) Intake	(i) Diet in relation to needs starvation fevers pregnancy anorexia nervosa (ii) Restrictions — religious and vegetarianism especially abroad (iii) Predilections — *eg* alcohol tea and jam
	(b) Absorption	Achalasia of cardia Gastritis enteritis carcinoma gastrectomy gastro colic fistula chronic steatorrhoea including sprue and coeliac disease ulcerative colitis chronic dysentery Diphyllobothrium latum
	(c) Liver Disease	Cirrhosis yellow atrophy secondaries abscess
	(d) Sterilisation of bowel contents	Chloramphenicol
	(e) Vitamins	B Group — Beri beri Pellagra Alcoholism Korsakow's psychosis (1889) Wernicke's encephalopathy (A) & D Steatorrhoea
5	Metabolic —	Porphyria Myxoedema Acromegaly Diabetes Anaemia Symptomatic Subacute combined degeneration Macrocytic Carcinoma
6	Infiltration —	Carcinoma Amyloid Leprosy Leukaemia
7	Familial —	Hypertrophic interstitial of Dejerine and Sottas (1893) and/or Gombault and Mallet (1889) Peroneal muscular atrophy (Charcot Marie Tooth 1892) Posterior root ganglion atrophy (Denny Brown 1951) Tangier disease
8	Mononeuritis multiplex	Polyarteritis Leprosy Embolism
9	Polyneuritis cranialis	Carcinoma — primary or secondary (nasopharyngeal) Glioma Lymphoma Chordoma Sarcoidosis DS (MS) Poliomyelitis Myasthenia gravis Tetanus

DIAGNOSIS

A very accurate and detailed history is the best single method of reaching a diagnosis In many instances the diagnosis is clear as in the known alcoholic and/or drug addict or in the chronic diabetic If a family history is known another group is rapidly solved Known deficiencies as of B1 or B12 will make for easy diagnosis Certain occupations may suggest a cause

If as often happens it is found that in spite of preliminary investigation a

diagnosis has not been reached what routine of testing should be applied? A suggested routine can be found below

FIGURE 3
ROUTINE OF INVESTIGATION

Chest X ray
Cerebro spinal fluid
Routine blood examination including
ESR and Retic or WR
Serum protein strip
Routine urine examination
Glucose tolerance curve
Pyruvate tolerance curve
Serum B12 and folate levels
Urinary porphyrins
Serum barbiturate level
PBI
Cytology for malignant cells
Electromyography
Nerve biopsy
Muscle biopsy
Bowel absorption tests

ELECTROMYOGRAPHY

This is a valuable form of accessory investigation most valuable in early or doubtful cases It should not be used as a substitute for the clinical evaluation of the general diagnostic problem It has useful quantitative aspects which help in finding out if a case is improving or worsening, or spreading EMG work needs to be done by an expert in a special department where plenty of time and experience are available

There are various techniques used their purpose being to study the conducting properties of nerves distal to their roots and plexuses The conducting properties are measured in motor and sensory fibres by the stimulation of the nerves The recording of the moment of onset of muscle activity after a motor nerve has been stimulated or the passage of an impulse up a sensory nerve after peripheral stimulation enable the conduction velocity to be calculated The recordings may be made by surface or needle electrodes sensory stimulation usually being done by ring electrodes encircling a digit The detection of spontaneous activity in nerves or muscles at rest suggests that the anterior horn cell rather than the nerve fibre is damaged a finding noted in for example motor neurone disease Average normal values for nerve conduction are about 40 metres per second and slowing below this level indicates nerve damage Sensory conduction quite frequently fails to nil

By the use of these tests in addition to exercising one's best clinical detective powers it is possible to reach a diagnosis in perhaps 45-55 per cent of cases Twenty-five years ago the figure was about 40 per cent and it may now have reached about 60 per cent since there has been a steady if gradual accumulation of detectable new causes

MANAGEMENT AND PROGNOSIS

These depend entirely upon an understanding of the principles that have been outlined Obviously these two most important features of the condition depend upon finding the cause of the disorder and remedying the cause whenever possible A complete recovery may often be obtained *so long as the patient is enabled to survive the acute phase of his illness* This point is the most important lesson which can be learned from this article Some cases of the disease advance with

extraordinary rapidity and it is not always possible to know which ones will be of the galloping kind. One's first thought in an early case should be: Is there an adequate assisted-respiration service available as soon as it is needed? If there is—and the patient can be dissuaded from the mildest exertion—he is going to survive the effects of the neuropathy unless its cause is irremediable as in malignant disease or in the confirmed alcoholic or drug addict. An equally difficult but less dramatic day to day matter is the maintenance of health and improvement in the *months* which almost always are required for recovery. The physician has to be robust and repetitive in his assurances. Too often a prognosis for recovery in 'a few weeks' has been given and the patient (often in a difficult frame of mind from the disease itself) becomes very difficult to manage as he learns that his progress is very far behind the schedule falsely given him. In this period physiotherapy provides both mental and physical support.

Lastly, what about treatment in those cases where no cause has been found? If the clinician is honest and tells his patient that he must wait until a natural recovery takes place in the fullness of time, what remedies will one's less scrupulous colleagues employ so that they may claim the cure and enhance their reputation as therapists? It is almost irresistible to use vitamin preparations as a method of avoiding long reassuring explanations so abhorrent to the scientific physician. And what about steroids? Dr. Stanley Graveson gave us the green light to use them many years ago and very many patients have benefited from their use. Steroids are always worth trying in an obscure case especially if there is deterioration.

As a final thought it is suggested that polyneuritis requires from everyone great vigilance for its early detection and diagnosis for it is by no means the prerogative of the neurologist. The condition reflects all aspects of medicine.

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ACUTE SPINAL CORD COMPRESSION

By Jason Brice

One of the problems facing someone in a very small specialty is that many of the conditions with which he is familiar are very rare in the life of a GP or even a general surgeon or physician. Such a condition is that of acute paraplegia due to compression of the spinal cord and/or its emerging nerve roots. Thus in one year at the Wessex Neurological Centre we may see 25 instances of this disorder out of 2 million people — one from 80 000.

My reason for speaking to you on this subject is that the only way of improving the outlook for these unfortunate people is, I believe, in the hands of the general practitioner.

I wish to begin by reminding you that the spine is a flexible tube rigid in its transverse diameter, composed of unyielding bone and fibrous tissue. At the time of compression therefore c.s.f. will be displaced with loss of the normal subarachnoid space: the condition we know of as spinal block. This is then followed by venous obstruction producing local oedema and yet further compression. Finally arterial and capillary obstruction occur resulting in infarction of the cord segments and/or roots concerned. One can in fact see all these changes in the roots of the cauda equina during operation for a massive central sequestration of the lumbar intervertebral disc. The tissues of the spinal cord and dorsal nerve roots are incapable of significant regeneration and once arterial blood flow is cut off the lesion is permanent. You will also recall that the blood flow of the spinal cord is organised on a segmental level: the arterial supply coming via the nerve roots, some radicular arteries being much larger than others, *eg* one at T10 level. There is a rather variable anastomosis up and down the cord principally via the anterior spinal artery, and these anastomoses are particularly poor in the mid thoracic region, a frequent site of cord compression. The blood supply of the nerve roots of the cauda equina is also somewhat tenuous, by means of end arteries running along the surface of the nerve roots.

Thus in acute compression we have a pathological picture which is somewhat analogous to that of the situation in acute appendicitis in childhood or the elderly. With this common disease most doctors carry a picture in their mind of the possibility that the appendix may infarct as a result of thrombosis of the artery and rupture of the viscus occur, resulting in a generalised peritonitis. How many of us, faced with an acute spinal neurological picture, realise that similarly the patient's ultimate well-being and perhaps survival is also hanging literally on the thread of arterial blood to the spinal cord segments involved or to the roots of the cauda equina?

What then are the symptoms of this disease that we may recognise it early? They are surprisingly uniform and for this reason equally surprising that they ~~(the cauda equina?)~~

npparently go unrecognised for some time Most cases of rapid compression are arising extradurally and as such are also primary spinal accidents There will therefore, be spinal symptoms such as a story of pain in the back itself varying from a few days to up to a few months prior to the later symptoms developing If the part of the spine concerned is mobile then there will also be a loss of function and the back will be stiff Entering spinal nerve roots are also commonly involved and as such root pain with the characteristic distribution and accentuation by coughing or sneezing is a main feature Thus the pain may run down the arm around the trunk like a girdle or down both legs or into the buttocks

Thereafter the symptoms of cord or root damage appear These symptoms may be abrupt appearing within a few minutes or may take up to 2-3 weeks to develop They progress at a variable rate and it is impossible to forecast how the symptoms will develop in the near future an important factor in the management since one cannot predict whether or not complete paraplegia will occur at any time The first symptoms that appear are usually motor weakness of the legs followed later by paraesthesiae and progressive sensory loss This loss is often ascending in type and deep pressure sensation is the last modality to disappear Sphincter disturbance is relatively late in the development of the symptom complex except where the sacral roots or cord segments are directly involved Lateralisation of the physical signs may indicate the original side of the cord involvement at first but later this is lost Rarely one may see patients presenting with entirely spinal cord or nerve root involvement and with no spinal symptoms or signs and these are patients harbouring intra-dural lesions Obviously the clinical picture will vary with the level of the offending lesion and so one may see all types from weakness of the perineal muscles and perianal numbness with sphincter involvement to a total quadriplegia A sensory level carefully looked for is present at an early stage and clearly points to a spinal origin of the neurological picture and its likely anatomical situation

Occasionally one may get valuable clues as to the cause of the cord compression A story of weight loss cough disorders of the alimentary tract etc may indicate the presence of a primary carcinoma The presence on examination of palpable masses and large lymph glands may also point to carcinomatosis or other disorders such as Hodgkin's or lymphosarcoma A story of previous back injury or sciatica or brachialgia may indicate the likelihood of disc disease Pyrexia the presence of previous septic lesions extreme tenderness of the spine may suggest pus as a compressing agent A story of previous visual disturbances or previous acute neurological incidents points to the likely diagnosis of multiple sclerosis although in my experience this is a very rare cause of the picture I am describing It is often however diagnosed Previous incidents of vascular disease or a history suggesting endocarditis have on one or two occasions pointed to vascular disturbances of the cord. Despite these pointers I must emphasise that in my experience of some 230 instances of this condition it is extremely difficult to distinguish

clinician the various types of compression with any certainty This is of little moment to the patient who for the reasons already described, requires urgent relief of the compression of his central nervous system This dilhenity is often disturbing for the clinicians under whose care the patient is, unnecessary and disastrous delays may occur whilst the clinician satisfies his academic ambitions

It is less difficult to distinguish acute compressive paraplegia from other neurological conditions At the stage of spinal disorder most cases are attributed to mechanical disorders of the spine such as osteoarthritis or disc disease and provided that this conviction does not persist in the face of the newer signs it is of little moment Later when the neurological picture over shadows the previous spinal signs the diagnosis may be confused with other common neurological disorders notably multiple sclerosis As I have said, this is a very rare cause of acute paraplegia alone although progressive spinal forms are well recognised A commoner problem is the distinction between this condition and that of acute transverse myelitis This latter condition of uncertain origin presents in precisely the same way and I know no way of distinguishing it except by myelography, although on one or two occasions I have been able to suggest it as a likely diagnosis because some small improvement has occurred before I have seen the patient I suspect it is a diagnosis into which we surgeons include several conditions we cannot identify some of which may be due to acute demyelination or vascular disease Hysteria has been another diagnostic problem particularly in the younger age groups Here careful attention to the story and local spinal signs have made the differentiation easy In every case I have seen in which this has been the initial diagnosis the patient has described symptoms such as extensor spasms pathognomonic of organic spinal disease and I need hardly remind you that this diagnosis can only be entertained let alone made when exhaustive clinical assessment has excluded the presence of organic signs Acute polyneuropathy and polyradiculopathy have on occasions presented diagnostic difficulties but the characteristic signs of peripheral nervous system involvement and a different mode of development have pointed to the presence of this condition However I have been badly caught out by rapidly developing neuromyopathies that may accompany carcinomas particularly those of the bronchus and may simulate cauda equina lesions The majority of such conditions show a different picture but on one or two occasions the differentiation has been difficult Vascular lesions such as a dissecting aneurysm of the aorta or thrombosis and occlusion of the aortic bifurcation (Leriche Syndrome) may give a similar neurological picture by virtue of the resultant cord or root ischaemia The presence of vascular signs in the lower limbs will suggest these possibilities

I have deliberately left the causes of acute compressing paraplegia until late in my talk as these are few and as previously mentioned cannot readily be differentiated from each other The commonest cause by far is that of extradural carcinomatous deposits arising from carcinoma of the bronchus breast prostate or kidney They account for about 90 per cent of acute paraplegias that we see It is unfortunate that the disease is of course incurable and if left untreated the

patient will inevitably die of a complete paraplegia with bed sores and chronic urinary infection usually within about four months With the exception of carcinomas which can be readily controlled by endocrine means ie breast and prostate the presence of multiple metastases makes this the inevitable end result, but with these two exceptions and in those patients without clinically overt metastases surgery and radio-therapy may offer an extension of life of some six months in a reasonable state of health Thus a quarter (25 per cent) of all patients that we see with malignant disease of the spine compressing the spinal cord, can be expected to return to walking and with sphincter control for about six months if treated promptly and adequately There is hope that if only we could treat these patients earlier the figures may improve for as well as with other forms of spinal cord compression the results seem to be related to the degree of pre operative neurological disability Thus in some 50 cases of complete loss of cord function I have never seen significant recovery to justify the therapeutic measures used I now therefore no longer treat such patients except symptomatically for pain It is too late If however the patient can still lift the legs against gravity, there is about a 50 per cent chance of return of function and if the limbs are even stronger then there is a 75 per cent prospect of reasonable recovery to be expected Other prognostic factors are operating Carcinoma of the bronchus is a particularly bad lesion The paraplegia comes on rapidly and so we tend to see the cases relatively late and very few instances of this condition do well with treatment At the other end of the scale localised masses of carcinoma of the breast and of the prostate lying on the postero-lateral surface of the spinal cord have a very good prognosis and once removed the patients may well survive for 1 3 years before the primary disease and localised recurrence kills them Another particularly favourable group are the solitary myelomas seen in the older age groups as with Hodgkin's lymphomas, the prognosis is much improved with early decompression and radiotherapy and such patients may survive several years with almost normal cord function before the generalised disease supervenes

The speed of onset of the paraplegia is another valuable prognostic sign Those occurring within a few hours do very poorly I have operated successfully on only one such case and this was within a few hours of the incident occurring Not all these problems of sudden paraplegia that we see are due to vertebral collapse and I believe that a vascular element in the compression occurs In general the slower the rate of development of the paraplegia the better the prognosis

In most cases seen in the neurological centre the neurological picture is the first evidence of malignant disease Clearly of course case selection has taken place by referring clinicians but I would make one important point In these cases we are often unable even after extensive investigation and possibly later post mortem to identify the primary site of the cancer From the patient's point of view I think nothing is to be gained by a desperate search for the primary tumour prior to treating the neurological lesion All that is likely to happen is that irreversible neurological changes will occur before the investigations are completed There is plenty of time once decompression has been carried out Further-

more scattered among the more malignant tumours are occasional benign ones when the only threat to life and well being is that of paraplegia and these favourable ones are often only discovered after operation when the histology is available Thus in my 230 cases there have been two osteoblastomas two chondromata three extradural arterio venous malformations with haemorrhage and two very slow growing fibrosarcomas and of these the only one to do well had incomplete neurological lesions at the time of surgery I do not propose to go into the radiology of these lesions as time does not permit except to say that often the plain X-ray changes are absent and rather difficult to see and myelography will merely show the presence of an extradural block to the flow of contrast at the appropriate level Vertebral collapse and large paravertebral shadows are obvious but present in less than half of the cases that I see

The remaining causes of acute compression are rare but important Disc disease is perhaps the more common Severe cervical spondylosis associated with mild trauma may be associated with an acute cervical myelopathy There is usually a previous history of brachialgia and mild long tract signs These conditions tend to do well with conservative treatment and if you wish to do well with surgery of cervical spondylosis choose the relatively acute myelopathies A cervical wound is an excellent way of immobilising the neck

More important to this talk is the acute total sequestration of a lumbar intervertebral disc usually through a central hole in the annulus fibrosus We see some 3-4 cases a year and there is always a considerable delay in treatment. In this condition a very large piece of the nucleus pulposus extrudes with some violence to compress all the lower roots of the cauda equina, resulting in sudden loss of sensation over the saddle area and loss of the sphincteric mechanism If the disc is at the L4/5 level then there will be additionally a weakness of the ankles and the term paraplegia is perhaps more appropriate At operation one can see the severe oedema venous engorgement and ischaemia of the roots involved Although a simple procedure to carry out I am afraid the recovery rate is poor mainly I believe because of unnecessary delay before the offending pieces of tissue are removed This is a neurosurgical emergency At the moment I have two or three unfortunate individuals with permanent loss of sexual and sphincter function heading steadily for ureteric diversion into ileal bladder or renal failure a poor prospect for people in their late 30's and early 40's as these patients so often are Although acute soft central disc prolapses undoubtedly occur in the cervical and thoracic region fortunately I have not yet been called upon to treat them

Infection is the next important cause of this syndrome Fortunately rare nowadays occasionally osteomyelitis will start in the spine and give rise to extradural pus and granulation formation Here the danger is doubled A septic thrombophlebitis of the cord vessels is superimposed upon the compression Antibiotics will often suppress the inflammatory element and make the condition harder to spot They never in my experience influence the course of the neuro-

logical disease. There is often a history of a pre existing infection but this may not be apparent when the patient is first seen. Pyrexia due to chest and urine infection may also confuse the clinicians but there is no mistaking the acute pain and tenderness and spasm of the spinal muscles. Spinal cord damage may appear with lightning rapidity and again this condition is an acute neurosurgical emergency the poor results once more related to severe neurological damage before definitive treatment is carried out. Chronic infections such as tuberculosis do not come my way although I have removed on two occasions benign tuberculous granulomas behaving as extradural tumours in patients of West Indian origin.

Finally, among these rarities there is a small collection of even greater rarities — haemorrhage into an arterio venous malformation of the cord a particularly difficult condition to treat. Haemorrhages into intra-dural tumours of the cord such as ependymoma and occasionally a neurofibroma or meningioma will sustain a haemorrhage and give rise to acute neurological symptoms. These lesions are relatively simple to treat.

How then should the general clinician manage these problems? The recognition of the fairly characteristic picture is not difficult. A history suggesting primary malignant disease may arouse his suspicions. A careful clinical examination reveals the presence of a primary or may reveal the presence of extensive metastatic disease. In the latter case there is little further treatment to offer and the patient may be made comfortable prior to his death. If there is no overt evidence of malignant disease then the patient should be promptly referred to a neurological centre for further diagnostic procedures and treatment. No time should be wasted in endeavouring to carry out complicated radiological or biochemical tests in order to ascertain a primary cause of the condition since this will only result in loss of valuable neurological function. Lumbar punctures and other simple neurological procedures should not be carried out unless one is suspecting a meningitis and this is unlikely in the usual presentation of these cases. There is some evidence that lumbar puncture causes a deterioration in the neurological condition and some Swedish writers have reported this in some eight per cent of cases seen. I have myself on some six occasions observed a serious worsening of the neurological picture immediately following the lumbar puncture. Furthermore lumbar puncture makes the subsequent examination of myelography much more difficult with a leak of c.s.f. into the subdural space the myodil may be inserted subdurally and the picture confused. Lumbar punctures is better carried out at the time of myelography in these conditions. X rays of the spine are of great value but must have been taken in centres where there is adequate equipment and facilities for these to be examined. As I have mentioned the changes may be subtle. Urgent surgery is indicated if only to save the remaining cord function. If total loss of neurological function has occurred there is little point in attempting decompression whatever the patient may be suffering from as I have never seen significant recovery occur after this.

I cannot compare the effects of radio therapy and surgery upon malignant tumours as most of my patients have been treated by a combination of both. All

I can say is that on some five or six occasions I have seen relatively benign conditions of the spine *ie* lymphoma and myelomas treated with radio-therapy initially become totally paraplegic whilst undergoing treatment From the physical factors involved in the pathogenesis of this condition I believe that urgent mechanical decompression is our only hope of improving what at the moment is a relatively unsatisfactory condition to treat

SPINAL VASCULAR DISEASE

By R. A Henson

This topic receives brief notice in neurological textbooks and there have been few communications on the subject in the British literature until the past few years The situation has been partially restored by important papers on pathology by Hughes and Brownell (1966) and on the clinical aspects by Garland and others While spinal vascular disease is not common it is by no means rare and practising physicians need a basic knowledge of the anatomical and pathological factors underlying the various clinical syndromes furthermore the subject carries important general implications in the neurology of the spinal cord The problem will be dealt with under the broad heading of haemorrhagic and ischaemic lesions

SPINAL HAEMORRHAGE

(a) *Epidural haemorrhage* This is very rare in the clinical situation The picture is that of acute epidural spinal compression My only personal experience was encountered in a woman who received anticoagulants elsewhere to cover cardiac catheterisation she developed massive epidural haemorrhage with severe pain in the neck and arms and rapidly progressive quadriplegia Recovery was almost complete following surgical decompression

(b) *Spinal subarachnoid haemorrhage* (*Haematorrhachis*) The clinical features fall conveniently into three groups (i) the results of the entry of blood into the spinal subarachnoid space (ii) symptoms and signs of intracranial extension of the haemorrhage and (iii) the results of damage to spinal cord and nerve roots

When blood enters the subarachnoid space the patient experiences sudden severe pain in the back the coup de poignard of Michon (1928) The pain is usually felt at the site of the haemorrhage tending to spread in radicular distribution as the blood flows throughout the subarachnoid space Bilateral sciatica accompanies backache when the haemorrhage develops in the lumbar sac or blood accumulates there Examination reveals signs of spinal meningeal irritation with head retraction spinal rigidity or opisthotonos and hamstring spasm Intracranial symptoms develop rapidly when the haemorrhage is in the cervical region but after a latent period of an hour or longer when the bleeding occurs at lower levels These symptoms include headache vomiting and disturbance of consciousness in severe cases more striking signs arise including papilloedema cranial nerve palsies ataxia and even major convulsions Haematorrhachis may be accompanied by haematomyelia though this is uncommon in our material and signs of spinal cord damage result Massive bleeding in the lumbar sac can lead to cauda equina compression with the familiar syndrome of flaccid paralysis sensory loss and sphincter disorder

Diagnosis of haematorrhachis ultimately rests on the demonstration of blood stained cerebrospinal fluid by lumbar puncture. Clinically the diagnosis can be difficult to establish from acute intervertebral disc herniation, vertebral collapse, spinal infections, arterial thrombosis, haematomyelia and dissecting aneurysm. However the picture of spinal meningeal irritation is also shown only by patients with spinal meningitis and extradural abscess. The absence of fever and other signs of infection are differentiating points from these infective complaints.

The differentiation of spinal from intracranial subarachnoid haemorrhage can usually be achieved on clinical grounds. While patients with intracranial bleeding may suffer back ache and sciatica, especially if they have remained ambulant, a history of prior headache can always be obtained. On the other hand, with primary spinal haemorrhage headache and vomiting follow the spinal symptoms. When massive spinal haemorrhage diffuses rapidly within the cranium the clinical picture can be seriously clouded. However there are commonly signs of spinal meningeal irritation to point to the proper site of the causal lesion. Exceptionally multiple vascular anomalies or diffuse lesions of polyarteritis nodosa present more formidable problems, requiring detailed radiological and other investigations for their solution.

Diagnosis of the Cause of Spinal Haemorrhage

The most important causes are angioma and tumour. Spinal angiomas can be recognised by the clinical evidence of a long cord lesion and they are well demonstrated by aortography and subtraction techniques. In our experience haemorrhage from tumours is rarely profuse, but may be recurrent. Ependymomas of the filum terminale bleed commonly, but the haemorrhage is mainly or entirely within the tumour, and the cerebrospinal fluid contains little or no blood. Diagnosis is clinched by myelography. Neurofibromata may also bleed. The important systemic conditions to recognise are blood dyscrasias and polyarteritis nodosa. It is unlikely that congenital or mycotic aneurysms will be certainly recognised. However aneurysm may be associated with coarctation of the aorta.

(c) *Haematomyelia*. This is included for completeness, but cannot be considered in worthwhile fashion here.

ISCHAEMIC LESIONS OF THE SPINAL CORD

A brief review of the anatomy and physiology of the spinal cord is necessary in order to allow the derivation of certain fundamental principles applicable to the differing pathological processes involved in ischaemic lesions.

Anatomy

The anterior and posterior spinal arteries do not form unbroken functioning channels which carry blood the entire length of the cord. The circulation is dependent on a variable number of segmental vessels. The most constant of

these is the arteria radicularis magna of Adamkiewicz which is always found among the lower thoracic or upper lumbar roots usually on the left. A second important vessel from the deep cervical or superior intercostal branches of the costo cervical trunk accompanies a lower cervical root and above and below these two from three to six other arteries reach the cord from the vertebral posterior intercostal lumbar iliolumbar and lateral sacral vessels. In general when the arteria magna is in the lumbar region the segmental blood supply is relatively well preserved but the anastamosis along the length of the cord is poor. Conversely when the arteria magna is in the thoracic region there are fewer radicular vessels but the longitudinal anastamosis is relatively good.

Although the absence of a regular segmental supply necessitates some longitudinal flow in normal circumstances there is little exchange between the territories of the various radicular arteries. Blood flows down the anterior aspect of the cord in the cervical lower thoracic and lumbosacral regions but upwards from the point of entry of the arteria magna or any intervening vessel to the second dorsal segment.

Circumflex vessels ring the cord uniting the anterior and posterior spinal arteries and supplying the superficial white matter. Anterior sulcal arteries enter the anterior fissure and turn left or right not both and not alternately to supply the grey matter and some of the white matter in the anterior two-thirds of the cord. Such vessels are least numerous in the thoracic region. Posterior spinal arteries supply the posterior columns and the tips of the posterior horns. It is unprofitable to define the vascular territories within the cord in detail.

Applied Anatomy

Individual variations in the number and situation of important radicular vessels and in the ability of the anterior spinal artery to act as a collateral mean that accidents and operations which are harmless in one patient may be disastrous in another. It is important that damage to the lower left intercostal vessels should be avoided during operations as the artery arises there in 80 per cent of cases. Occlusion of an important radicular artery will often produce infarction particularly in the watershed zone at the periphery of the territory supplied. Infarction may therefore occur several segments above or below the level of the causative lesion while a more distal part of the cord independently supplied survives. Aortic occlusion is potentially less dangerous as collaterals can maintain pressure and flow beyond the block to some extent.

Certain distinctive clinical syndromes are recognisable. Occlusion of a radicular artery causes a central necrosis of the cord over several segments a lesion which is clinically indistinguishable from infarction of the anterior two thirds of the cord due to occlusion of the anterior spinal artery. Occlusion of an anterior sulcal artery produces a partial Brown-Sequard syndrome. Posterior spinal artery occlusion causes segmental anaesthesia with areflexia and distal loss of kinesthetic sensation, the syndrome is rare. Occlusion of the venous drainage produces a clinical picture of cord transection pathologically the brunt of the damage falls

on the white matter and clinically there is loss of position & colour sensation which is not a feature of anterior spinal segmental or anterior sulcal arterial obstruction

Physiological Studies

Histological studies have shown that when a limb is active or is traumatised blood vessels in the corresponding segments of the ipsilateral half of the cord dilate This observation explains the predilection of the poliomyelitis virus for such areas The inability of atheromatous vessels to dilate during activity explains why some arteriopaths only develop signs of cord disease during activity Transient increases or decreases in flow during effort sleep or in a hot bath may account for the effect of these circumstances on certain paraplegias Studies on the effects of aortic compression have yielded important information on the period of ischaemia the spinal cord will tolerate Paraplegia only develops with compression above the renal arteries and the grey matter is especially vulnerable Ischaemia of more than thirty minutes duration carries grave risks of permanent cord damage Lastly hypotension can play an important part in determining the timing of cord infarction

Lesions due to Cardiovascular Disease

Atheroma is the commonest cause of spinal ischaemia Patients are often elderly arteriopaths who present with claudication of the cord a transient ischaemic attack, an infarct or possibly a syndrome resembling motor neurone disease There is some dispute as to the frequency of atheroma in actual cord vessels the more important changes are found in the aorta which is often calcified and its branches

Intermittent claudication of the cord is characterised by the painless appearance of cord symptoms on exertion for reasons previously mentioned Transient ischaemic attacks may occur in isolation or as a prelude to infarction Actual infarction tends to occur at night or during exertion and there can be difficulty in determining whether the lesion is due to arterial occlusion or haemorrhage Radicular pains and paraesthesias are sometimes prominent at the outset and the clinical picture is simply that of an acute cord lesion within the distribution of the affected vessel There is a rise in the cerebro spinal fluid protein, and myelography may show a cord sufficiently swollen to produce a block The prognosis for recovery is poor unless substantial improvement occurs within 24 hours and even when complete recovery occurs there is always the possibility of a more severe recurrence Several French and Scandinavian clinicians have drawn attention to a painless progressive flaccid paraplegia without pyramidal or sensory deficit which is believed to be due to chronic cord ischaemia In view of the demonstrable sensitivity of the grey matter to ischaemia it is conceivable that some examples of spinal muscular atrophy are caused by spinal cord ischaemia More pathological evidence is required in this area

Hypotension

Paraplegia may occur during hypotensive episodes in patients whose spinal circulation is already compromised. Infarction has been recorded in a patient with multiple Adams Stokes attacks.

Emboli and thrombi

Embolic infarction is rare, though well documented. Emboli derive from the heart valves, atheromatous aortic plaques and the nucleus pulposus. Paraplegia can also occur in caisson disease. Occlusion of the aorta by thrombosis or embolism rarely causes paraplegia as the block is usually well below the level of the renal arteries; however occasional examples have been reported. Diagnosis is achieved by aortography. The results of surgery are largely unrewarding.

Other Causes of Infarction

Though formerly common, syphilitic spinal arteritis must be a rare cause of cord infarction in the United Kingdom.

Iatrogenic, Ischaemic Paraplegias

New surgical, radiological and anaesthetic techniques have caused a number of neurological disasters and have emphasised again the danger of damage to a major radicular vessel. Paraplegias have followed sympathectomy, pneumonectomy and thoracoplasty, and are particularly liable to occur after aortic surgery above the diaphragm. Clearly every effort should be made to avoid damage to intercostal vessels, and especially those adjacent to the diaphragm on the left side near the origin of the arteria magna.

It is sometimes difficult to decide whether a paraplegia is due to surgery or the aortic lesion itself. Thus occlusion of the mouths of intercostal vessels by a dissecting aneurysm is an established cause of central cord necrosis. A few segments distal to the infarct may survive, sustained by a small lumbar vessel. However in a recent personal case, surgery for a dissecting abdominal aortic aneurysm certainly produced a paraplegia of this type.

The cord may also be damaged following aortography and intercostal nerve block. In these cases it is likely that a large dose of toxic material has fortuitously entered a large radicular artery, but the full explanation is not known. Lastly, external cardiac massage seemed to play a part in the production of paraplegia in one of our cases.

Ischaemic Myelopathy due to Trauma, Spondylosis, and Intervertebral Disc Lesions

Damage to important vessels can occur during exertion, from manipulations of an infant during a difficult delivery, and from abdominal injuries. The importance of vascular involvement in the myelopathy associated with cervical spondylosis or dorsal disc herniations is well recognised. The syndrome of *sciatique paralysante*

is less familiar here acute back pain is followed by sciatica which gives way to severe weakness of dorsiflexion of the foot and objective signs of cord damage This initially puzzling syndrome is due to ischaemia of the affected nerve root and infarction of the anterior part of the cord because a herniated lumbar disc has compressed a lumbosacral vessel which supplies the distal part of the cord

Intraspinal Lesions Including Neoplasms

Primary intraspinal tumours which compress an important artery can produce false localising signs Thus a tumour at the foramen magnum may cause wasting of the intrinsic muscles of the hand conversely a tumour in the lumbar region can produce signs of a mid-dorsal spinal lesion by compression of the first lumbar radicular artery Malignant deposits in the extradural space sometimes cause paraplegia by obstructing the venous drainage which leads to extensive white matter damage over several segments with relative sparing of the anterior horn cells

CONCLUSION

In this brief review only a few selected aspects of spinal vascular disease have been discussed However enough has been said to indicate the importance of knowledge of the spinal vascular system to all physicians and surgeons and not simply to medical and surgical neurologists

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PROGRESS IN THE TREATMENT OF PARKINSON'S DISEASE

By Reginald Kelly

Clearly research into the treatment of Parkinson's Disease as in any condition can be divided into two parts. The first and most important is to investigate the cause and when this has been established to apply the necessary preventive measures. In this respect we have travelled some distance. Encephalitis can be reduced in incidence by the appropriate public health measures and it appears as though the damage that it does to the nervous system can frequently be reduced by using steroid therapy at the appropriate time. Manganese Carbon Monoxide Carbon Disulphide Phenothiazine drugs and Reserpine can be avoided but we have reached nowhere in our attempts to discover how the primary system degeneration of the corpus striatum arises or what can be done to prevent the steady march of arteriosclerotic ischaemia.

The second approach is an attempt to abolish the cause of incapacity or to ameliorate the symptoms — the tremor the rigidity the akinesia in this disease. Over many years it has been clear that one group of drugs will indeed exert a powerful effect on the symptomatology of this disease. These are the anti cholinergic drugs. Benzhexol (Artane) Benztropine (Cogentin) Orphenadrine (Disipal), to mention a few. These all act more or less efficiently according to their anti-cholinergic activity and correspondingly according to the power of this activity they produce the side effects of this activity. For many years it has been clear that a new approach is needed to find a drug that has a different action and possibly a different site of activity drugs that is that are not limited in their use by anti cholinergic side effects.

In the early 1950's Lawrence and the author conceived the idea of blocking the unwanted electrical activity on its way down from the basal ganglia. At the time there was much interest in a series of drugs that appeared to block activity at synaptic junctions. There seemed to be some evidence that the effect of these blocking agents was magnified by the number of synapses through which the pathway ran so that it became possible to work out a dose which would let the impulses through a long monosynaptic pathway such as the pyramidal tract yet at the same time to block an impulse that had to travel through many short internuncial neurones. There was evidence that the impulses that produced tremor pass through such multisynaptic pathways and in a series of acute experiments we were able to show that tremor could be abolished completely by using Phenothiazines and Mephenesin without interfering with voluntary activity (Kelly and Lawrence). Our observations were of interest although they proved to have little therapeutic application as Mephenesin was too rapidly metabolised to be of value and the Phenothiazines used continuously aggravated the rigidity and the tremor in the end is a result of another activity of these drugs.

Our next series of experiments was a trial of an agent made by Smith Kline and French which was supposed to inhibit the metabolism of Mephenesin but these came to an end when it became clear that this drug induced mania in all the patients we tried it on and Smith Kline and French lost interest in seeking further along these lines (Kelly and Lawrence) There were many steps sideways but the next step forward from the pharmacological point of view did not occur until Barbeau in 1963 and Birkmayer and Hornykiewicz in 1962 reported on the use of an amino acid called Dihydroxypheayl alanine (DOPA) The reports suggested that this might produce a temporary improvement — a suggestion that was later decried by McGeer in 1964 Fehling in 1966 and Yahr also in 1966 How

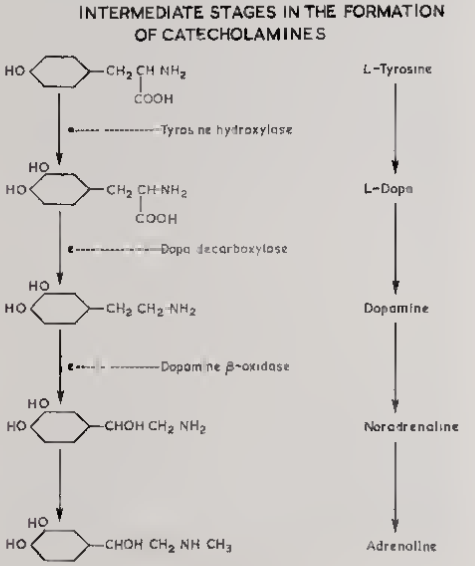


Figure 1

ever, it seemed clear that this was a substance that warranted further investigation because there appeared to be a good rational basis to its use. In 1965 Pakkenberg and Brody and Duffy and Tennyson had shown that in Parkinson's Disease there was a decrease in Melanin pigment in the substantia nigra and Hornykiewicz (1963) had shown that there was a substantial decrease in the Dopamine content of the substantia nigra.

Here it will help matters if we look at Figure 1 which shows the intermediate stages in the formation of Catecholamines. You will note that the Dopamine is formed from LDopa as a result of the activity of Dopa decarboxalase. It is Dopamine that is missing in the substantia nigra. What then is the action of Dopamine?

At this point we enter into the realm of speculation — speculation that has partly been provoked by the fact that Dopa does appear to work. The big question that remains at the moment unanswered is 'Is the action of Dopamine that of a neuro chemical transmitter?' Martha Vogt is doing some interesting work at Cambridge which she feels is very suggestive that this is at least one of its roles. We have not time to discuss her work this morning. A further point of interest in this respect is that quoted by Yahr and Bering (1966) remarking that work done by Seitleberger *et al* (1964) and by Poirier and Sourkes (1964) had shown a reduction of Striatal Dopamine following lesions of the substantia nigra and that the levels had been demonstrated to be normal on the opposite unoperated side.

Figure 2 illustrates the mechanism that might explain all that we know today about the various ways in which the symptoms of Parkinsonism may arise or be ameliorated. The disease, whatever its aetiology, causes most damage in the subs-

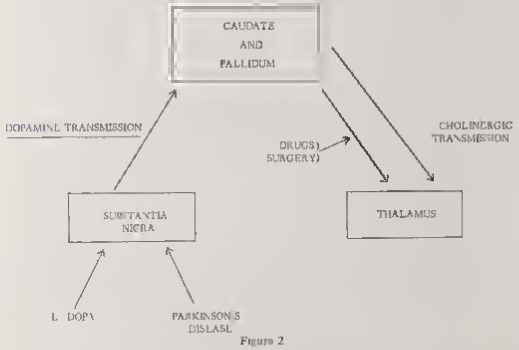


Figure 2

stantia nigra with a resultant fall in the pigmented cells and the Dopamine content. If Dopamine is a neuro chemical transmitter then it can be postulated that there is a loss of the controlling interest on the candate and the pallidum usually exerted by the substantia nigra resulting in unwanted activity arising in the candate and pallidum sending impulses by cholinergic transmission to the thalamus

Hence, anti-cholinergic drugs block this unwanted excess activity with the side effects produced by the anti-cholinergic activity elsewhere Surgery blocks this activity in the same pathway On the other hand LDopa may well work by being decarboxylated in this neighbourhood producing sufficient Dopamine to restore to the substantia nigra its controlling role in the candate and pallidum

So on the assumption that this hypothesis might be correct Cotzias (1967) and his associates in Brookhaven looked at the known biochemical abnormalities — the decrease in the Melanin Pigment and the biogenic amines including Dopamine and decided to investigate the possibilities of restoring these deficiencies particularly as the deficiencies might well be interrelated since in both Melanocytes and sympathetic cells Tyrosine is hydroxylated to DOPA a common precursor in the synthesis of both Melanin and Catecholamines Their first experiment was to test the result of using intramuscular Melanocyte Stimulating Hormone, 20 to 40 milligrams at a time This is known to increase Melanin deposition in the skin and melanocytes and possibly might do the same for the substantia nigra This idea was based on a misconception as there are no melanocytes in the substantia nigra. However this series of experiments was a failure — the patients were made worse

Their next series was to test the effect of DL Phenyalalanine a precursor of Dopamine and this exacerbated both rigidity and tremor Their next series was to test the effect of DL Dopa and the results were very encouraging indeed it became clear that if the patient could tolerate a large enough dose an effect on Parkinsonian tremor and rigidity could be produced that was far better than could be reproduced by any of the preceding drugs or by surgery DL Dopa has been abandoned as it produced alarming effects on the bone marrow and now in all trials the much more expensive LDopa is being used There can be no doubt that it works in most patients, however incapacitated Dysphagic, dribbling rigid wrecks can be restored to active life and an almost chairbound patient can run and play volleyball These are results that have been repeated by several workers in New York in Bonn and in the author's hands in England. What is more after withdrawal from the drug its effects persist for at least a further fourteen days There can be no doubt that this is the drug of the future in this disease if the snags can be ironed out and the snags are many Its cost is almost prohibitive — £20 a week at least It has to be used in very large doses because if given by mouth it is decarboxylated in the liver and the spleen and the decarboxylation at these sites has to be saturated to allow any to reach the brain Ninety five per cent of oral LDopa is thought to be decarboxylated outside the central nervous system so doses of five to eight grammes a day have to be used with a list of side effects that are formidable and in many cases prohibitive

Side Effects:

Nausea and vomiting (said by Cotzias (1968) to be transitory but not so in the author's experience)
Faintness
Elevation of blood urea
Transitory sleeplessness
Marked increase in PBI
Elevation of BP (3 in 26)
Transitory granulocytopenia (2 in 26)
Involuntary movements (10 in 26) (Cotzias 1968)

The involuntary movements took the form of:-

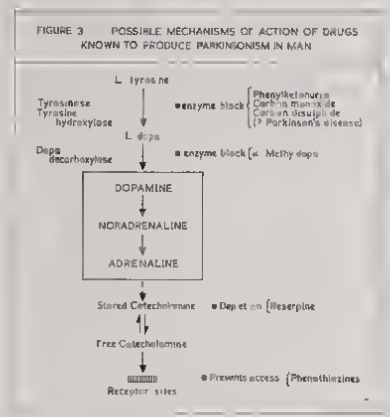
Excessive gesticulation
Grimacing
Moving legs and feet like an organ player
Involuntary gnawing
Short lived panting
Intermittent protrusion of the tongue
Intermittent wave like movements of the head (Cotzias 1968)

It is interesting to note how like these are to the movements induced in some usually brain damaged patients by excessive doses of the Phenothiazine drugs It is also interesting to note that none of these side effects occur in doses of less than 1 5 grammes a day.. more about this point later

Amelioration of symptoms is variable — it suffices to say today that in a significant number of patients all the symptoms — dysphagia, aphonia dysarthria sweating mental apathy.. tremor rigidity.. almost all disappear In Cotzias's cases there was some improvement in all and dramatic improvement in over half of 26 treated

The limiting factor is the enormous dose required and the inevitable toxic effects In this respect some interesting work that is being carried out in the laboratories of Hoffmann la Roche in Switzerland by Bartholini (1968) offers considerable hope They have elaborated a drug labelled for the moment RO4 4602 and not on the market which inhibits the DOPA decarboxylase in the liver and spleen etc.. which is responsible for getting rid of the LDopa before it reaches the brain This elegant piece of pharmacology has produced a substance that does not pass through the blood brain barrier and so 95 per cent of the LDopa ingested can reach the substantia nigra instead of the five per cent previously and once it gets there the brain Dopa Decarboxylase (being not inhibited by RO4-4602 as it itself has not passed the blood-brain barrier) is able to decarboxylase the Dopa into Dopamine where it is needed So a dose of under one gramme a day exerts the same effect as the previous eight grammes a day without any of the inhibiting side effects We wait with impatience the completion of toxicity trials of this preparation so that it can be marketed and used

In the meantime it is worth pondering the question as to why, using a precursor of L.Dopa that is DL Phenyl Alanin does not work when LDopa does. Cotzias (1967) suggests that since the conversion of Phenyl-Alanin to L.Dopa requires hydroxylation it is logical to suggest that effective hydroxylation of this or other aromatic amino acids might be the biochemical error in this disease. We might here consider Figure 3 to illustrate the position of the present hypothesis on the action of drugs known to produce Parkinsonism.



Finally we come to the question of surgery. The aim of surgery is to produce a block as suggested in our discussion about Figure 1 and illustrated in Figure 4 taken from Marion Smith (1967) which shows possible sites of damage.

I do not wish to waste time discussing the anatomy further. The question that needs answering today is "What is the place of surgery?" Here we are up against a very difficult question to answer briefly. In an attempt to bring the over enthusiastic surgeon down to earth, let us examine the reported results of surgery at a recent symposium on Parkinson's Disease in Edinburgh. At this Symposium the results of surgical treatment were discussed and the advantages of various sites of lesion were compared with these results. The reported results at various centres



Diagrams indicating course of pallidofugal fibres (continuous line) and dentato-rubrothalamic fibres (dotted line). The location of various target areas for stereotactic operations is indicated by cross-hatching

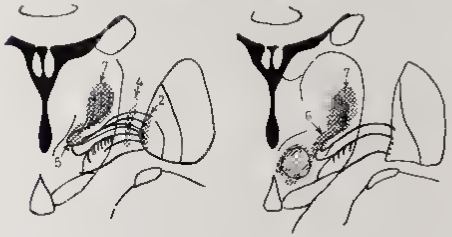


Figure 4

1 and 2 Pallidal — involving Pallido fugal fibres in the ansa lenticularis. If one misses these fibres it has to be a much bigger Pallidal lesion (3)
4 A large capsular lesion may implicate enough fibres
But 5 and 6 a small lesion in the antero lateral nucleus of the thalamus can do the same
But 7 other thalamic lesions would have to be bigger

were widely different. Mundinger *et al* (1968) reported an average improvement of 80 per cent in activity postoperatively. Brodie Hughes (1968) reported only 16 per cent and Yahr and Hoehn (1968) suggested in a large study of the results of several different Surgical Centres that the average maintained improvement was 0 per cent. How can we explain such discrepant results? Well the answer became obvious. People just are not comparing the same things. There is no scheme of activity ability measurement accepted by all. Some patients are assessed on drugs — some off drugs. Some are assessed after admission to hospital and a preliminary work up of intensive physiotherapy and drug therapy. If you take any Parkinsonian however incapacitated and show an interest in him his activity will improve

for a time and hence the exaggerated claims for any new drug introduced to the market. One can reckon to improve the activity of any patient by at least 30 per cent by admitting him to hospital in this way. If after doing this an operation is carried out and he remains about the same or marginally improved, then this is recorded by some as a failure or a Brodie Hughes 15 per cent improvement. But any improvement gained by such an admission is so short lived as to be abolished within two months of discharge because unless L-Dopa is being used such improvement is not maintained in the majority of patients once they leave hospital. So a far more just evaluation of the success of surgery in this condition is obtained by comparing post-operative activity with an evaluation of the patient's activity in their home and at work after being established on the maximum dose of drugs tolerable and secondly after estimating the downward descent of the patient's activity in the previous two years. For surely the value of treatment depends not only on the immediate improvement in activity gained but also on the maintenance of that activity as compared to the measured pre operative deterioration? A patient untreated or poorly treated medically can be assured an 80 per cent improvement both by surgery (*cf* Mundinger) or by drug therapy and it is therefore not necessarily a surgical success. A patient whose disease has been static fully treated for years and who remains static following surgery has probably not been helped unless their activity is measurably improved.

But a patient who has been deteriorating for years and who following surgery remains static without measurably improving their capacity can also surely be counted a considerable success and it is because all these cases are inextricably mixed up in everybody's statistics that Yahr is able to report his figures of nil improvement. The fact remains that in spite of the variability of these reports surgery remains (temporarily only the author believes) the best we have to offer most patients with this disease who have progressive disease and who are clearly reaching a position of unemployability in spite of their taking the maximum tolerable dose of anti-cholinergic drugs — until that is L-Dopa is more fully available.

The criteria for recommending surgery or refusing surgery vary in everybody's hands but the author has pursued the following policy over the past 14 years. Surgery is recommended in all patients in whom the limit of tolerance of drugs has been found and who are nevertheless deteriorating or who are close to the point where their employment is at risk. The author advises against surgery in those patients who are clearly arteriosclerotic or who have signs of a dementing process or who are tolerating drugs poorly in steadily decreasing doses or who are a poor 65 or older. It is the custom of some surgeons to refuse to operate on patients who appear to be ataxic or who are akinetic but the author thinks the first should in fact be rejected only if their ataxia is a manifestation of vertebral basilar ischaemia and he has seen excellent results in some akinetic immobile patients who have nothing to lose but possibly a lot to gain. He has frequently over persuaded his surgical colleagues to operate on what they call unpromising material and on only two occasions has the decision been regretted. In the author's series of 66

cases selected on this basis every other patient has gained something by surgery that has been maintained long enough to be favourably comparable to their pre-operative state. An analysis of the author's series has succeeded in convincing him that none of the accepted points for or against surgery allow one to make an informed guess as to how much improvement will follow. The most unlikely patients have done well, the most likely have at times received little or no benefit. The author therefore refuses to accept the view that there are patients who are too incapacitated by this disease to make surgery worthwhile so long as they are not incapacitated also by parallel disease of the cerebro-vascular system or by a cortical atrophy.

ACKNOWLEDGMENTS

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THE RADIOLOGICAL INVESTIGATION OF A CEREBRAL TUMOUR SUSPECT

By James Bull

First of all may I remind you of the situation about 100 years ago and just before the advent of X-rays Before the discovery of the ophthalmoscope we had no means of looking at any part of the brain except at postmortem It was just 102 years ago that Tarck described changes in the optic fundus by using the ophthalmoscope discovered by Helmholz 15 years previously Then in 1870 Hitzig and Fritsch discovered the excitability of the cerebral cortex and in 1874 Bartholow applied an electric current to the cortex of man through a lacuna in the skull caused by a cancerous growth and stimulated the opposite side of the body Meanwhile Broca a French anthropologist and surgeon discovered the speech centre and anaesthetics had just been discovered Thus the stage was gradually being set for the surgical exploration of the brain William MacEwen a young surgeon in Glasgow later Sir William MacEwen was the first to see the important clinical applications of the recent discoveries In 1876 when still only 28 years of age a boy aged eleven one day came under his care The history was as follows twenty-six days after a head injury resulting from a fall with slight wounding of the head a convulsion occurred It started on the right side of the face then involved the right arm and leg and was followed by loss of consciousness This lasted half an hour after which the right side of the body was paralysed and aphasia had set in The boy was only able to say No No and he was apparently distressed by his inability to express himself otherwise MacEwen diagnosed an abscess in Broca s lobe and he proposed to open the skull and expose and evacuate the abscess but the parents refused The boy died and MacEwen sought permission to expose the brain exactly as he would have done in life This permission was granted and an abscess about the size of a pigeon s egg was found in the white matter of the brain to the inner side of the left third frontal convolution Thus the diagnosis was triumphantly confirmed

This was 19 years before Roentgen discovered X-rays and 25 years before the introduction of lumbar puncture but it was not until 1924 nearly 30 years after the discovery of X-rays that any serious neuroradiological discussion took place in this country and that was at the Royal Society of Medicine to consider the merits and demerits of the method of ventriculography which had been discovered 6 years previously by Dandy at Baltimore Dr Wilfred Harris not long dead was President of the Section of Neurology that year and more than one neurologist still in practice was in the audience Thus it is obvious that radiology has only recently assumed any importance in neurology

Ventriculography received a poor hearing at that meeting it was thought to be an extremely dangerous and unwarranted procedure and was in fact the spur which led Moniz to discover cerebral arteriography He said in his original com

munication in 1927 that Clearly the English were not altogether satisfied with ventriculography

Thus although radiologists were slow starters in the field of neurology it must be generally agreed that they now have a more diverse armamentarium for the radiological investigation of the brain than for any other part of the body However a number of the investigations are not without hazard to the patient One

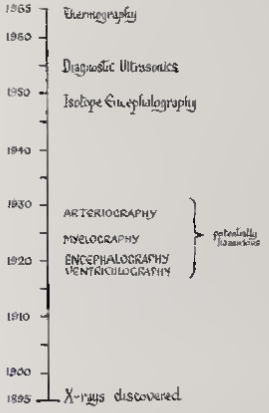


Figure 1 *Historical Development of Neuroradiology*

is frequently called upon to see people who are very acutely ill and thus there is a great responsibility to choose the appropriate investigation in any given case We should make it our goal to obtain all necessary information with a minimum of danger and discomfort to the patient The choice of the order of investigation and the number that it is necessary to use are often difficult to decide. It is my purpose to try to outline certain principles which should guide us

With the exception of a very few clinics radiology was hardly used in neurology until the nineteen thirties When a suspected intracranial mass was to be operated on the neurologist told the surgeon where to explore Sometimes the bone flap

was made on the wrong side or infratentorially when it should have been supra tentorial and vice versa

When I began neuroradiology about 30 years ago the procedure was simple if a surgical lesion was suspected one did a ventriculogram if non surgical an air encephalogram Nowadays we can best divide the procedures into those which are virtually harmless to the patient and those of some danger It goes without saying that an accurate complete and well interpreted history forms the essential basis followed by a detailed physical examination especially on the nervous system including very often charting of the visual fields and neuro otological tests The more accurately the physician can focus the site of the suspected lesion the better the radiologist can help and more definitive investigations can be arranged This is particularly important when one comes to contrast investigations which can be unpleasant traumatic and carry some morbidity But even with simple pro cedures it can be of importance To quote the simplest example if the lesion is lateralised clinically then the appropriate lateral radiograph should be taken

I would like to elaborate the non traumatic procedures a little One tends wrongly I believe to think of the clinical examination only in terms of what the neurologist can do with the instruments he carries in his little bag such as his pin his cotton wool his tuning fork and his ophthalmoscope But logically we should add the less portable equipment the EEG machine the paraphernalia for neuro otological tests and lastly the ever increasingly complex apparatus housed in the X ray Department

The non-traumatic radiological armamentarium consists of the following

1 Plain X Rays which may be divided into
   - (a) survey films
   - (b) special projections
   - (c) stereoscopy
   - (d) tomography

2 Ultrasound
3 Thermography } both of limited value
4 Brain scanning

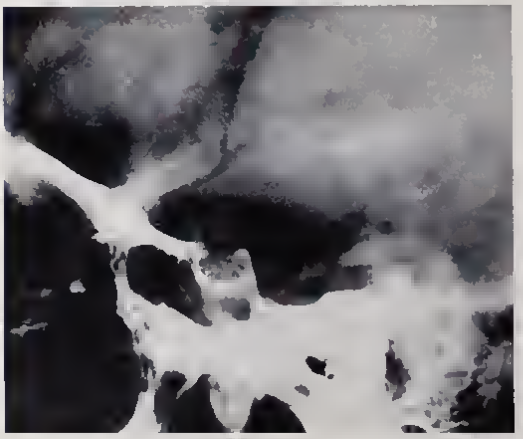
None of these procedures upsets the intracranial hydrodynamics or is a hazard to the patient To all this for adults especially one must add a routine X-ray of the chest as something like 10 per cent of intracranial neoplasms are metastatic and the great majority are primary in the bronchus

I cannot overstress the importance of regarding plain X rays as part of the clinical examination. Not infrequently have I seen neurological cases followed for months sometimes years without skull or spine X-rays being taken Further more we know nowadays that occasionally the first and only sign of raised intracranial pressure is manifested by changes in the sella turcica and decalcifica tion of the dorsum sellae may sometimes precede papilloedema

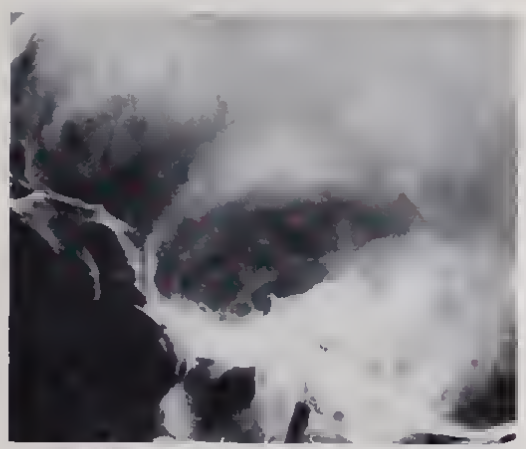
There is very little doubt that from the radiological aspect the sella turcica is the most important bony structure within the cranium. Its appearances provide the key towards the diagnosis of a very large percentage of intracranial space-occupying masses. These lesions may lie within the sella itself adjacent to it or even remotely in the skull. Thus a survey in 1958 by Mahmoud undertaken at the National Hospital, Queen Square, gave the following findings:

	Number of Cases	*Sella Change*	*Percentage with Sella Change*
Intrasellar tumours	49	48	98
Perisellar (adjacent) tumours	63	34	54
Metasellar (remote) tumours	408	179	44
Total	520	261	50

These figures show that about half of the masses adjacent to or remote from the sella showed definite changes, while masses within the sella almost invariably showed changes.



[illegible] Normal Sella



Large frontal meningioma

One is also reminded of the not inconsiderable amount of organic disease which occasionally lingers for years in mental hospitals sometimes because simple radiology has been forgotten

Recently a revolution has taken place in the further non traumatic investigation of neurological patients the diagnostic use of radioactive isotopes The history of this application is fascinating but space does not allow the recounting of it It is sufficient to say that about 5 years ago the method began to be used in this country and it has revolutionised the work-up of a neurological case suspected of harbouring an intracranial mass

The main advantages are

1 It is benign and carries no morbidity
2 Provided the lesion is greater than 2 cms diameter a very high proportion of tumours and other intracranial masses together with infarcts can be shown
3 It can be very suitably undertaken on out patients a great social and economic advantage The method is naturally applied extensively to in-patients as well

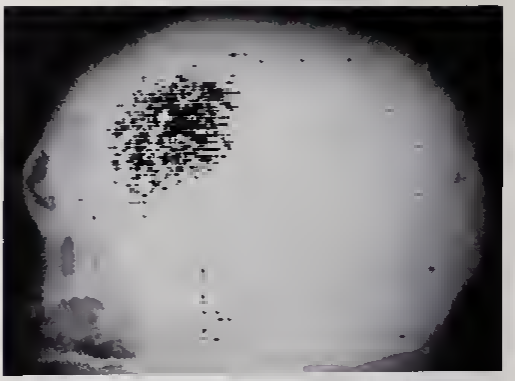


Figure 4(a) *Lateral scan of [illegible]*

The contrast investigations available are

1 Ventriculography — historically the first
2 Encephalography
3 Positive contrast ventriculography
4 Myelo encephalography
5 Angiography

Angiography is the most elaborate in that a number of different vessels can be injected and in recent years more attention has been focused on the cervical and thoracic portions of the great arteries leading to the head for as is well known many strokes are caused by occlusion of the main vessels in the neck and vascular strokes often cannot be differentiated from tumours

Valuable though cerebral angiography is it is still relatively crude and at this moment in time only the major vessels can be displayed Advances in macro radiography with the use of finer focus tubes and finer grain X ray film are on the way but not yet fully realised

Computers in Neuroradiology

Nowadays very many investigations are available in neuroradiology and some are traumatic carrying a degree of morbidity and requiring a general anaesthetic it is therefore very desirable to decide which investigations are the most valuable



Figure 4(b) *AP scan of same*

in any given case Furthermore it would be most helpful to know in which order they should be undertaken with a view to providing the maximum information with the minimum of trauma and morbidity It is here that a computer might be very valuable, quite apart from the assistance it might provide as a skilled diagnostician As du Boulay has stated What the neuroradiologist is searching for all the time is the pathognomonic the 100 per cent sign and it is possible to overlook or reject many small points which added together might make a diagnosis with equal certainty It is difficult to remember the significance of such combinations over long periods of time

With these points in mind du Boulay assisted by Professor Price a mathematician at the new City University in London set up a computer programme They have recently published their first results in the *British Journal of Radiology* and the work done is most encouraging

Their pilot programme comprised three closely related groups of tumours

1 intra and perisellar
2 suprasellar
3 juxta mid infratentorial (masses at and caudal to the tentorial hiatus)

The programme was based on 200 operatively or autopsy confirmed cases Firstly they broke up the radiological examination into eight parts called Comprehensive Tests which correspond to (1) plain X rays (2) carotid (3) vertebral angiography (4) encephalography (5) ventriculography (6) positive contrast ventriculography (7) myelo-encephalography and (8) scanning Each is given a number 1 8

The Compreheusive Tests in their turn are divided into many basic tests each consisting of a definable radiological sign For example there are 88 basic tests which they have read from plain skull X rays — eleven for the sella alone

There are 68 basic tests for carotid angiograms and about 400 basic tests altogether

Lastly there is a Disease Index

Essentially the computer does two things

1 It gives a diagnosis or differential in statistical order of probability
2 It recommends the next best test to undertake in order to sharpen the diagnosis

As time goes on more and more confirmed cases are fed into the computer and by this means it is hoped that its diagnostic acumen will improve

I would like to end by trying to summarise du Boulay's opinion about Computers in Neuroradiology

1 The Computer in no way replaces the observer Each sign in the list must be thought about and assessed as positive negative or unreadable and the definition of all the signs must be clear in the mind of the radiologist. This in itself demands a clarification of thought which should go a long way towards improving interpretation
2 The choice of signs to put in the programme in the first instance is made on the basis of previous experience but it is possible to supplement or subtract from them
3 One of the most interesting products of this work so far has been the data print-out It is possible at any time to obtain on one piece of paper the frequency of every radiological sign in every disease so far accumulated Some cherished signs are revealed as worthless in themselves

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MANAGEMENT OF TRANSIENT CEREBRAL ISCHAEMIA

By R. W. Ross Russell

There are two pathological processes which cause transient cerebral ischaemia. The first is a local circulatory disturbance resulting in infarction of a small area of the nervous system and giving rise to a minor stroke. This rapidly recovers due to compensatory mechanisms in the normal brain surrounding it. Nevertheless on pathological examination there is a small area of ischaemia (lacunar infarct).

The second type is fundamentally different and is due to a transient occlusion of a blood vessel usually by an embolus which then passes on the blood supply being fully restored. This results in transient ischaemia but with the restoration of the blood supply the area does not undergo any permanent damage. Numerous attacks of the second variety may occur without the patient suffering any permanent residuum whereas in the first variety the lacunar stroke the damage is cumulative.

Types of local circulatory disturbance

(1) Emboli used to be thought of as little pieces of lead shot impacting in vessels and remaining there indefinitely. It has become clear in the last few years that this is not a usual event at all and that most emboli are neither solid nor permanent. They fragment or are dissolved they move on to small vessels and if they do so rapidly the result may be complete restoration of the circulation. The source of such emboli is often mural thrombus in a large cervical artery.

(2) The second variety of local circulatory disturbance is a small haemorrhage. There is a tendency to think of cerebral haemorrhage as a massive event frequently leading to coma and death of a patient. This is often the case but not invariably. A small haemorrhage can often give rise to what appears to be a relatively minor stroke (lasting for hours and not for minutes) but nevertheless easily mistaken for an ischaemic episode.

(3) The third mechanism is intermittent compression of an artery and this applies particularly to the vertebral circulation which runs through a bony canal with many points of narrowing. During rotation of the neck it is quite normal for the vertebral artery to be kinked and for the flow through it to be compromised. Usually because there are two vessels this is of no importance but if one is diseased or absent or the kinking is very severe then a fall in blood supply to the posterior part of the brain may result when the patient turns his neck or extends it.

(4) The fourth mechanism is called the Steal Syndrome. This colourful phrase refers to redistribution of cerebral blood flow which occurs as a result of vasodilatation in extra cerebral tissues. In the best known variety the subclavian artery is partially or wholly occluded at its origin and when the patient exercises the arm vasodilatation takes place beyond the occlusion which leads to a reversal of blood flow in the vertebral artery. Such cases are unusual but they do illustrate an im-

portant pathophysiological event and we are now beginning to think in terms of Intra Cerebral Steal as well as Subclavian Steal This is of some interest with respect to the question of vasodilator treatment of air emboli in the spinal cord It now appears that vasodilatation in normal areas of the brain produced by CO_2 for instance may compromise blood supply to an area of ischaemia and may in fact do much more harm than good

Prognosis

Management and treatment of transient cerebral ischaemia must be considered in the light of natural history There are very variable reports in the literature about this depending on the stage of the illness at which the patient is seen It is impossible on clinical grounds to distinguish an isolated attack of transient ischaemia which recovers and does not recur from one which heralds a major stroke and this is the major problem in management

About a third of the patients who have suffered from transient ischaemia do develop a major completed stroke but this is very variable and differs according to the type of transient ischaemia under discussion. There are a number of features that indicate a good prognosis —

(1) Very brief attacks lasting up to half a minute these are not common

(2) The site affected is also significant in the vertebro basilar territory attacks seem to have a better prognosis than they do in the carotid territory

(3) Patients with a normal blood pressure and an absence of arterial disease in other situations have a better prognosis than those who are arteriopathic.

(4) A long history also indicates a good prognosis in other words attacks occurring over many months The rule is that if a stroke follows a transient ischaemic attack it usually does so after a short time and after a few attacks Conversely if the patient is seen a long time after the onset or has had a great many attacks it is much safer to give him a good prognosis

Management

To turn from prognosis to the practical management if a patient is seen during an attack it is impossible to know whether this is a major stroke. or whether he will recover in a matter of minutes First-Aid measures are of importance especially the position of the patient and the air way Oxygen has gone through a number of phases of popularity and otherwise One-hundred per cent oxygen is a powerful vaso-constrictor and reduces blood flow to normal brain For this reason at the moment it is not thought wise to give oxygen to a patient who has just had a stroke nor is the treatment with hyperbaric oxygen considered to be very encouraging However for the reasons already mentioned ischaemic brain may behave differently from normal brain and it may well be that oxygen treatment or hyperbaric oxygen will have a place in the future

The blood pressure in a patient who has just suffered a stroke is seldom very helpful It is often elevated and if severe this may indicate medullary ischaemia If 24 hours after the stroke there is high blood pressure with evidence of chronic hypertension such as retinal haemorrhages or papilloedema it is reasonable to reduce the blood pressure subcutaneous injection of pentolinium is a useful way of doing this Cerebral oedema is undoubtedly an important feature in many severe strokes and it may be helpful in a patient who is deteriorating or waiting admission to hospital to use Dexamethasone and Lasix (Frusemide) although these principally act on normal rather than ischaemic areas of the brain Respiratory depressants should be avoided and barbiturates should not be given even if the patient has had a focal fit CO_2 which used to have a vogue is probably best avoided for the reasons already given It merely increases the blood supply to the normal brain at the expense of the ischaemic area These remarks apply equally to other vasodilator substances such as nicotinic acid Heparin is also best avoided in the acute stage because of the difficulty of making quite sure that one is not dealing with a cerebral haemorrhage

Considering now the treatment of a patient who has had a transient attack it is very valuable from the point of view of the future management of the patient to enquire into the circumstances of onset such as any relation to neck turning and the occurrence perhaps in sleep or during exertion This gives considerable help to the physician in deciding whether he is dealing with a thrombosis or a haemorrhage Sleep of course has always been equated with the occurrence of a cerebral thrombosis and this is a good rule on the whole but patients on hypotensive drugs may develop dangerous levels of hypertension during recumbency at night and so we are now seeing a few cases of cerebral haemorrhage occurring during sleep which was previously very unusual The blood pressure and cardiac status is particularly important in relation to a source of embolism As well as mitral stenosis with atrial fibrillation which is probably still the commonest cause of cerebral embolus one must always be alive to the possibility of a recent myocardial infarction which may not have been a painful one and which may have been followed by mural thrombosis in the left ventricle which breaks off and travels to the brain Subacute bacterial endocarditis is in every student's list and should not be forgotten The emboli may be frequent and small and unaccompanied by very much in the way of a cardiac murmur and early treatment is very important Other physical signs which are worth eliciting even in this early stage are auscultation of the carotid arteries for a localised bruit and observation of the retinal arteries, the reason being that occasionally one can see emboli in the retinal arteries which may not be there for very long and which give a very important clue to the etiology of the stroke.

I think the majority of patients who have a transient ischaemic attack should be referred to hospital unless they are very old or unless they have an intercurrent illness of some kind

Management in hospital

The hospital doctor is principally concerned with two questions when faced with a case of transient ischaemia: is the diagnosis correct and can the recurrence of ischaemia be prevented by any of the measures at our disposal which are anticoagulants and vascular surgery or by treatment of any incidental illnesses? It is surprisingly difficult on some occasions to exclude other diagnoses. Focal fits may not be accompanied by very much in the way of obvious movement and may be mistaken for a transient ischaemic attack. Migraine as you know may be almost indistinguishable unless you enquire carefully for the history of headache or previous attacks. A small haemorrhage may easily be mistaken for a small ischaemic area and I think every neurologist has mistaken a tumour for a minor stroke at one stage particularly a secondary tumour which is rather vascular and tends suddenly to enlarge presumably by bleeding. Vertigo as an isolated symptom is a particularly difficult one: there is often uncertainty as to whether this represents a disorder in the peripheral part of the vestibular system or a transient ischaemic attack in the brain stem.

A second point is the presence of a general circulatory disturbance: a cardiac infarction, mitral stenosis, polycythaemia and anaemia all of which can present as transient ischaemia. The investigations one would initiate to look at this would be a cardiograph, full blood count going on to further and more sophisticated tests if polycythaemia seemed likely and if subacute bacterial endocarditis is suspected then the patient is admitted for blood cultures and charting of the fever etc.

A third point of importance in treatment and prognosis is the presence or absence of generalised vascular disease. Here the history is extremely important: the age of death of both parents and near relatives: the presence of hypertension, diabetes or hypercholesterolaemia in the patient or in the family and any complaints suggesting intermittent claudication or anginal pain.

Fourthly the physician is interested in the localised disease of the neck vessels because of the possibility of surgery in that area. The methods used are palpation and auscultation. It is very important to feel as well as to listen because of course in a completely occluded vessel there is nothing to hear. Blood pressure should be taken in both arms: the radial pulse should be taken in both arms simultaneously because of the possibility of subclavian artery disease.

Finally the difficult decision has to be made whether to go on to angiography either by puncture of the carotid artery or by the arch technique where the origins of all four vessels are outlined at one time. Angiography at present is advocated only in the carotid territory since it is essentially a prelude to operation and is not justified unless one is prepared to go on to recommend surgery for the patient should a localised vascular abnormality turn up. My practice is to limit it to patients under the age of 65 who are otherwise in good vascular status and who have attacks suggesting ischaemia in the carotid territory.

The significance of carotid stenosis. It used to be thought that one of the principal causes of transient ischaemic attacks was attacks of temporary hypo

lension in the systemic circulation. This mechanism, called Hemodynamic Crisis by Dr Denny Brown of Boston, was thought to produce in the territory of an occluded or narrow vessel a temporary decrease in blood flow due to failure of collateral circulation. Now this is undoubtedly a very important mechanism in some patients but it is equally clear that it does not cause the majority of transient ischaemic attacks. Observations made during the ischaemic attack seldom show systemic hypotension nor any disturbance of cardiac rhythm or fall in the cardiac output. Indeed blood pressure is often higher than normal.

Transient ischaemia is almost certainly multifactorial in origin, some attacks being due to a general disturbance of circulation and others being due to the dislodgement of emboli of a small fragmenting variety which impact momentarily or for a few minutes in the cerebral circulation and then pass on without leaving any permanent deficit. Hypertension is also important because in the condition of hypertensive encephalopathy which usually occurs in younger people in association with renal disease transient ischaemic attacks may occur, probably due to acute spasm of vessels; this responds dramatically to lowering the blood pressure. Polycythaemia is a very rare cause of transient ischaemia but an important one to exclude and nowadays the sickle-cell trait should also be thought of the mechanism presumably being an increased blood viscosity raising the cerebral vascular resistance. In the presence of an unaltered blood pressure this of course reduces the cerebral blood flow. Why it does so intermittently and why it is usually in the brain stem is difficult to explain.

Finally we come to the various treatment groups which have been established as a result of hospital investigation.

(1) The patient who has a transient ischaemic attack with a cardiac lesion may be suitable for cardiac surgery such as valvotomy and if not, should go on long term anticoagulants. This is of proved value in these recurrent emboli and it should not be stopped even after five years.

(2) The second group consists of transient ischaemic attacks in patients who are normotensive and have no abnormality on the angiogram or on whom an angiogram is not done because it is not felt to be justified. Here is a difficult situation. there is some indication that anticoagulants are beneficial but because the evidence is questionable anticoagulants should only be continued for six to 12 months. The results in the large American trials which have been done on this group show that the transient ischaemic attacks are undoubtedly reduced in the treatment group but both the treatment group and the control group have the same number of severe permanent strokes.

(3) The third group transient ischaemic attacks in association with carotid or subclavian stenosis. Here our present feeling is to use reconstructive surgery provided the lesion is isolated and can be safely dealt with. This means doing an arch angiogram to see that the other vessels are patent because the operation inevitably interrupts the supply of the carotid blood for a short time while the clamps are on. The results of surgery are still being evaluated, but there is little

doubt that transient ischaemic attacks may be abolished in a great majority of cases by carotid endarterectomy. Total internal carotid occlusions are inoperable. (4) Fortnightly transient ischaemic attacks in association with sustained hypertension. Here I think hypotensive agents are indicated and Dr Marshall's work in this field suggests that it is a valuable preventative measure. The optimum desired level of blood pressure is in the region of 100 mm hg diastolic and the powerful ganglion blocking agents should be avoided if possible. The transient ischaemic attacks precipitated by neck turning, of course, can be dealt with by a collar.

In summary it is important to err on the optimistic side when giving a prognosis. Patients and relatives more readily forgive mistaken optimism than mistaken pessimism in their doctors. Embolism, particularly from the heart, major arteries and heart valves, should always be considered in the diagnosis of cerebral ischaemia since these respond most readily to anticoagulants and to surgical treatment.

INTRACRANIAL INFECTION RELATED TO E N T DISEASE

By John S Garfield

I must first apologise for speaking about a subject which is not of course primarily neurological in its origins but I do so for a number of reasons The first is that we are dealing with a condition in which the primary and momentous decisions are taken usually not by Neurologists or Neurosurgeons but by General Practitioners Physicians and Otologists and it is these primary decisions that may on occasions end in such utter catastrophe

The second reason is that we seem to have a continuing but steady trickle of cases of intracranial abscess each year and in fact over the years since 1951 including 1967 this has remained constant in Neurosurgical departments dealing with acute cases As a Neurosurgeon one is concerned essentially with intracranial abscess usually either intracerebral or subdural rather than meningitis but it is just this differential diagnosis between intracranial pus and meningitis which proves so very difficult and so crucial in management

The background to what I am going to say concerns first this continuing incidence of intracranial abscess and secondly as I shall show our failure to improve results of treatment and this I find very humbling My remarks are based upon a series of 200 cases of intracranial supratentorial abscess admitted to the National Hospital Atkinson Morley's Hospital and the Wessex Neurological Centre over the years 1951 to 1967 and they fall very conveniently into two groups of 100 separated precisely by a gap of 10 years

TABLE I

Overall Results

Group	1957 100 Cases	1967 100 Cases
Dead	37	42
Severe Deficit	7	7
Well	56	51

You will see that in the two periods of 100 cases each our results did not improve and in fact in 1967 when we treated 20 cases 10 died This is at variance with so much of what is taught about our apparent advances in management

The factors I want to examine with particular references to ENT sepsis are first, how much is ENT sepsis responsible for abscess? Secondly the problem of differential diagnosis between meningitis and intracranial abscess Thirdly the relationship of the bacteriology in the ENT territory to the bacteriology that is found intracranially Fourthly the value of the ENT sepsis as a guide to the localisation of the intracranial pus and finally the place and timing of ENT surgery

To turn first to the place of ENT sepsis in the genesis of these abscesses we found that there had been little falling off in the number of abscesses due to ENT sepsis

TABLE 2

ENT Sepsis as Source of Abscess

	1957	1967
Temporal	31	23
Cerebral	10	15
Subdural	12 (18)	17 (70)
Total	56	55

What I think is very striking is that the subdural abscesses increased in number and were more than ever due to ENT sepsis

The next factor is the differential diagnosis between meningitis and intracranial pus in a patient who has ENT infection It is much more likely that the patient with otitis media will develop meningitis rather than a temporal or cerebellar abscess But the problem is is it safe to do a lumbar puncture in these patients? It has been said in the past that the dangers of lumbar puncture have been exaggerated and it has even been preached that when a patient with a mastoid or middle ear infection is not doing well that the first thing to do is a lumbar puncture It is clearly not reasonable to subject every patient with mastoid disease who is not doing well to full neuro radiological investigation How then can we define which patients are more likely simply to have meningitis and which to have an intracranial abscess? We have shown that lumbar puncture is a real hazard in the presence of an intracranial abscess This is particularly so with cerebellar abscess but it is also so with a supratentorial abscess We considered the presence of certain neurological signs at the time that the first lumbar puncture was done or on admission to the neurosurgical departments and I compared them with 50 patients who in fact had meningitis without any intracranial abscess the signs that we took were an unequivocal hemiplegia or hemiparesis a homonymous hemianopia or dysphasia indicative of a hemisphere lesion with or without papilloedema and it became very clear that the incidence of these signs was very significantly higher in the patients who had an abscess

TABLE 3

Incidence of Neurological Signs as Defined

	200 Abscess	50 Meningitis
At referring hospital or before LP	136 (68%)	15 (30%)
At Neurosurgical Unit	181 (90%)	17 (35%)

We feel therefore, that if a patient with ENT sepsis develops a stiff neck and fever but at the same time has hemisphere signs such as a hemiplegia homonymous hemianopia dysphasia with or without papilloedema then that patient should not have a lumbar puncture or further lumbar punctures but should be referred immediately for neurosurgical investigation

It is said that the c.s.f findings in intracranial abscess are in themselves significant and help in the diagnosis This I believe to be quite fallacious and the c.s.f can be mildly abnormal or in fact completely normal

[illegible] next to the problem of bacteriology [illegible] the ENT sepsis. The common organism which was obtained from the ear swab was usually a gram negative organism often Proteus. It was much less commonly a staphylococcus and very rarely a streptococcus. When we came to look at the bacteriology obtained from intracranial pus we were somewhat surprised the striking

TABLE 4

Bacteriology — Organisms Identified

Organism	1957	1967	Total
Streptococci	55	50	105
Pneumococci	2	5	7
Staphylococci	31	9	40
Coliforms	12	18	30

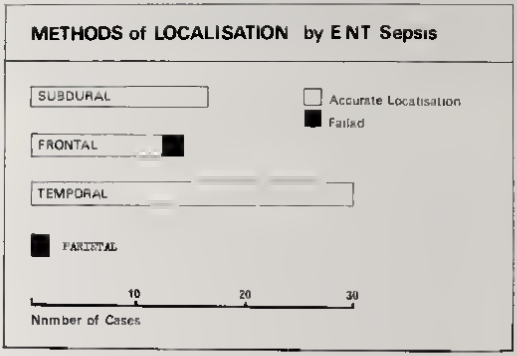
thing being the very high incidence of the streptococcus. The streptococcus is usually anaerobic or microaerophilic and often is extremely difficult to cultivate and the examination of the gram film when the pus was obtained was crucial. What was even more surprising was that often when only a Proteus had been obtained from an ear swab it was still the streptococcus which was in the intracranial pus. I think the lesson from this is that whatever the organism obtained from the ear swab high dosage penicillin of up to 12 mega units in 24 hours must be given to the patient as soon as the diagnosis of intracranial abscess is entertained and other antibiotics appropriate to the ear organism added. One will never lose anything and one may gain a great deal by starting high dosage penicillin immediately the diagnosis of abscess is considered before bacteriological proof is obtained.

Let us turn now to the problem of localisation of the intracranial pus in relation to the foci of ENT sepsis. McEwen had an almost unbeatable record for the treatment of temporal abscess which he wrote up in 1893 he did it purely on localisation by the focus of ENT sepsis. With the refinements and more exhaustive investigation radiologically of patients nowadays this has been forgotten. We are often faced with an acutely ill patient whose level of consciousness is rapidly deteriorating and the making of a burrhole under local anaesthetic however sick the patient in skilled hands has a negligible mortality and morbidity. Therefore we examined the cases in which the burrhole was placed for aspiration of the intracranial pus purely on the basis of the ENT sepsis and this had the most remarkable success.

It is particularly striking with the subdural abscess which is often so difficult to diagnose and localise by the conventional radiological methods. The temporal intracerebral abscess was found every time that the burrhole was placed on the basis of the ENT sepsis and when one compares this method of localising pus with other methods the figures showed that it was superior in many respects.

To turn to the problems of ENT surgery itself either of the mastoid middle ear or the frontal and ethmoid sinuses. Clearly adequate mastoid or frontal sinus treatment is desirable to prevent the development of an intracranial abscess and

TABLE 5



I was certainly not able as a Neurosurgeon to assess the efficacy of Otological surgery which these patients had undergone either before or after they developed an intracranial abscess and one must accept that if a patient has chronic otitis media and has developed an intracranial abscess then that otitis media will in due course require surgery The problem as far as the Neurosurgeon is concerned is when this should be done because there is a school for thought amongst Neuro surgeons who believe that this mastoid surgery should be done immediately Therefore we examined the timing of mastoid surgery in these patients in relation to their ultimate outcome

TABLE 6

Timing of Mastoid Surgery

	Total	Dead
Before Intracranial treatment	20	5
During First Week	10	2
Later	12	1

There were 12 patients who had their mastoid surgery later than the first week after the abscess was aspirated and in half of these patients it was done after the fourth week It is also interesting that even when these patients had their mastoid treated before they came to the Neurosurgeon there was still a very

high mortality and I think these and some other figures we obtained have shown that mastoid surgery in these patients although necessary is not a matter of urgency and may be delayed

To turn to the problem of frontal sinus and ethmoid sinus surgery we could not reach any conclusions about the timing or desirability of frontal and ethmoid sinus surgery in those patients who have developed an intracranial abscess There was little to choose between those who had ENT surgery and those who did not and there is I believe some evidence in otology to suggest that if frontal and ethmoid sinus infection is treated enthusiastically and immediately with high dosage antibiotics frontal and ethmoid sinus surgery is rarely or never necessary

TABLE 7

Frontal and Ethmoid Sinus Infection

	Total	Dead
ENT Surgery	19	4
Without ENT Surgery	28	13

To summarise these few aspects of intracranial abscess related to ENT sepsis I would say that the problem is not lessening certainly not as far as Neurosurgeons are concerned who deal with acute cases that ENT sepsis gives a most accurate guide to the localisation of the intracranial pus that lumbar puncture in these patients who may have an abscess is dangerous and that there are certain criteria for avoiding a lumbar puncture and finally that the critical examination of this large number of cases caused most of my conceptions about the management of intracranial abscess to go by the board

REFERENCE

McEwen W (1893) Pyogenic Infective Diseases of the Bone and Spinal Cord Glasgow J Maclehose & Sons.

Clinical Notes and Cases

AN UNUSUAL CASE OF SHOE POLISH CONTACT DERMATITIS

By Robert H Broughton

Case Report

A Naval Nurse presented with a deep brown black pigmentation on the back of the left hand with central vesiculation and surrounding halo of brown erythema (Fig 1) The previous day she had purchased and used a tin of black shoe polish the make of which she had not used before She also had a similar mild reaction on the palm of the right hand the inner right thigh where she had probably slept with her left hand in apposition during the night the tips of the fingers where she had opened the tin and finally the base of the right hypothenar eminence which had been touched by the shoe brush while polishing (Fig 2) None of these marks would wash or scrub off and were deeply embedded



in the superficial layers of the skin She had a mild [illegible] of the palms such as is common in young females Her skin was otherwise normal and she had no allergic background or skin history

The interesting and unusual feature was that before she went to bed the previous night after cleaning her shoes for a second time that day she had a bath and her hands looked perfectly clean There had been only momentary contact with the polish When she awoke the following morning an allergic pigmentation reaction had occurred During the course of the next few days pigment appeared deep in the finger nails and this again would not wash out



[illegible]

Clinical Course

Her [illegible] reaction with anti-inflammatory steroid cream and the clinical course was uneventful although a faint superficial scar was still detectable on the back of the left hand four months later

Histological Findings

A biopsy was performed on the involved skin area of the right hand (Fig 3) and was reported as follows

The upper layers of the horny layer are disorganised and contain numerous black granules This is considered to be chemical reaction akin to a charring

of the superficial keratinised cells. Between the pigmented area and the granular layer is a clear eosinophilic zone which is unaffected. The nucleated epidermal cells and the dermis are unaffected.

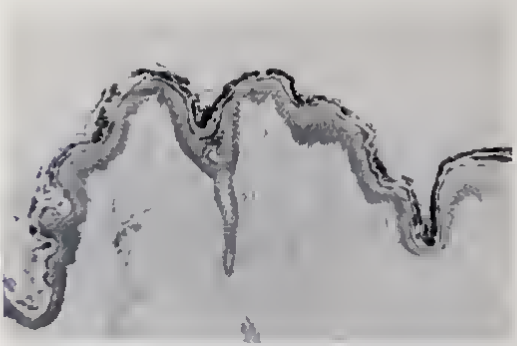


Figure 3

Patch Tests

A patch test on the left buttock with the undiluted polish was strongly positive. The constituents of the polish were next patch tested separately on her back. Undiluted inert wax, carbon black, nigroscene stearate and 5 per cent dilution of white spirit and hydrocarbon solvent were all negative. She gave a marked reaction to the perfume compound known to the trade as 'eodorant Violet 3567 (this perfume is no longer contained in the polish, though it was not withdrawn for any medical reason). She was found to be weakly positive to the well known compound called methyl haptene carbonate, which is a known sensitiser, thought to be responsible for the perfume of violets.

Summary

The sequence of events was probably as follows:

1. Invisible superficial scarification from the shoe brush bristles carrying into the top layers of the skin perfume, carbon black and dye as a passenger.
2. Though her hands were washed after using the polish and appeared to be perfectly normal when she went to bed, the next morning she awoke to find the hand and right thigh blackened and blistering. Presumably she had slept with her hand next to the right thigh and during the night a curious charring effect took place.

Over the next few days where the right palm cradled and nursed the left hand the same reaction came up on the right palm

4 As healing took place the skin began to flake and peel off like a poorly applied black paint rejected by an unprimed unsuitable under surface

5 A fast sensitising effect had taken place for she had no previous contact with this polish or perfume

6 Apart from two hardly noticeable faint scars on her hand she made a complete recovery She was advised to avoid Devon Violets in the future[1]

COMMENTS

Why this nurse reacted in this peculiar way remains a mystery as this has been the only recorded case with this particular shoe polish In a personal communication from the Director of the company it would appear that millions upon millions of tins of polish in which this particular compound is incorporated have been sold but nothing has ever appeared before which would have indicated that it could be the cause of any trouble

ACKNOWLEDGMENTS

My thanks are due to Mr P S Shaw Director Luxan Ltd and Professor C D Calnan FRCP St John's Hospital for Diseases of the Skin for their kind co operation and interest in this case.

EMOTIONAL DIFFICULTIES ENCOUNTERED IN NAVAL FAMILIES

A Child Guidance Analysis

By Peter C. Matthews

Introduction

This paper aims to present a picture of one large section of our local community and to delineate some of the problems encountered by the Children's Section of the Nuffield Clinic working with it.

Our interest in the families of sailors was forced upon us by our patients. Attempts have been made to construct a useful research programme to examine the effects of the absent father but a first stage in experimental design consists of the examination of the population to be studied.

This study concentrates on the families of sailors and those recently discharged sailors where effects lasting from the Service life can still be demonstrated. In the course of a year about 40 Naval families are seen in a referral rate of 500 a year and most of the current series came to the Clinic in the last 18 months. We have not attempted much in the way of a statistical approach because of lack of numbers. We have on the other hand, tried to examine various specific areas in which problems arise and to illustrate these areas by examples from case material.

Background

Plymouth is one of the home ports of the Royal Navy. Devonport dockyard is capable of building as well as undertaking major repairs of ships. Thus sailors may be in Plymouth when their ships are based in home waters, when they are awaiting new ships, when they have their ships in the dockyard for repair or when they are keeping their families in Plymouth although another port is being used for home waters cruising.

The families of these sailors have to cope with several stresses and amongst these one should mention:

1. The effects of discipline on the fathers.
2. The effects of posting.
3. The hazards of actual warfare.

During the period studied there were no problems related to actual warfare and probably the most important situations arose because of posting with its implications of family separation or family movement or both. Stable families appear to tolerate repeated moves, unstable ones react in various ways, sometimes presenting to one section of the social services sometimes to another. At the Clinic we tend to see those where the children are presenting educational or social problems.

Naval separations tend to be fairly long lasting up to 18 months in the Far East but are balanced for the non technical grades by very reasonable hours when the ships are in home ports or on short sea cruises. The Navy's own Welfare Department does its best to help with really serious difficulties and we have always found very ready co-operation in our negotiations on our patients behalf. Some families however fear to approach Welfare because of ideas that this might jeopardise promotion chances for the husbands.

Families who move around tend to live either in Naval Hirings or in Married Quarters or occasionally seek private accommodation. Those who opt to stay in one place and tolerate the absences often buy a house and plan for the time of ultimate discharge and civilian life. One of the major attractions of Naval life is the better standard of pay for the skilled shipboard technician compared with his land based counterpart and this is especially true in Plymouth where there is a Naval tradition and where the alternative employment picture is far from rosy and the Dockyard although a large employer pays rates which are low compared with National averages.

One problem discovered when an attempt was made to estimate the size of the population of Naval families was that while ships are based on Plymouth the families of the men in them may not be in the area. There are no records of the number of Naval families in the locality so one cannot really tell whether the referral rate is greater than might be expected by chance. In any case the referral rate is passing through a period of expansion distorting the whole picture.

A further difficulty is the constant state of flux in the situation where there are always new families arriving and ones leaving who have been or are being treated. In some cases the disruption of the educational programmes is very severe and adjustments to be made by the mothers are very difficult.

Other Studies

Literature exists on the subject of the Military Family and the absent father particularly in the American journals and from these two recent attempts to define some of the problems were examined. Fagan *et al* (1967) described the absence of the father as a crisis state and in their descriptions suggest that the reaction behaviour patterns may be classified in a small number of ways. They further suggest that direct programmes of discussions directed to full exploration of the problems to be faced when the father is away should assist the mothers in their coping.

Lyon and Oldaker (1967) described three phases when the family is likely to be upset during anticipation of posting, during separation and probably the most important of all on the return of the father to the family which has accustomed itself to managing without him. Lyon states that the pre school child finds father absence hardest to bear and understand reacting with a period of considerable distress for three weeks or more in a specific pattern of sleeplessness

The adolescent boy is the other individual in the family said to be specially at risk. These authors stress that separation often causes a positive gain in the sense that the mother may feel a real achievement in managing on her own. Both authors stress the disruption in schooling and Lyon suggests possible solutions involving rapid recognition of the mobile child, attention to integration into the school and the provision of a sensible child based curriculum for these children.

In Britain Wynn (1964) has written of the problems of the fatherless in more general terms and with special emphasis on the divorced, separated and bereaved mothers.

This Study

The paper is based upon 76 children referred to the Clinic in 1967 and 1968. All of these children had fathers who were or had been in the Royal Navy, Royal Marines and in one case Merchant Navy and in one case in the MOD (Navy) but with a similar pattern of mobility of paternal separation.

These cases were removed from the routine cases seen at the Clinic and attempts were made to find patterns of symptoms in the material. The resulting symptom groups appeared to be related to three main problem areas.

1. Problems resulting from mobility
2. Problems resulting from separation
3. Problems resulting from personality traits

PROBLEMS RESULTING FROM MOBILITY

a. Housing problems
b. Neighbourhood problems
c. Educational Problems

a) *Housing Problems*

Our sample lived as follows: City 36, suburbia 19, village 16, new estate 3, isolated 1.

These categories indicate housing density and availability of recreational space as well as commuting problems and social exclusiveness. It is true that the local people tend to be rather insular, especially the Cornish villagers who regard the mobile families as foreign.

The housing chosen (and it is chosen because the Navy makes money available for housing loans) was: Mortgaged or owned 35, quarters 19, council 10, rented 8, hired 3.

The Navy has several estates around the city, notably at St Budeaux, Tamerton Foliot in Cornwall near HMS *Raleigh* and in Plymstock for officers. Hirings are houses privately let to the Navy often by other Navy families who are posted abroad.

Interestingly we did not find many complaints over problems of housing rehousing etc. There were of course understandable reluctances to move too much but most families proved adaptable and what dissatisfactions there were seemed to relate to loss of friends in Naval Married Quarters rather than any complaints over districts loss of money or adaptations to different climates. Indeed a major attraction of the Naval life for many wives was the prospect of a spell in Singapore.

Perhaps two special problems deserve mention in this context. One couple was extremely anxious over the rather pleasant property they were occupying and the child played upon this anxiety with destructive and dirty behaviour in the home. The other problem was that of living with in-laws. Between moves the Naval family often spends a tranmatic few months with in-laws and these periods of instability can cause especial difficulty. Four cases of in-law problems are recorded. Most of the group examined however are occupying private houses and so the days of in-laws are mostly behind them. The families in Council housing are also reasonably certain to stay there and it is only in the few Quarters and Hirings that this particular stress may arise.

Where the family opts to remain in one place and if one's husband is to be at sea anyhow it seems the sensible thing to do then there are the problems of separation. In the present study it seemed that these presented a greater challenge to families than mobility but since they are a part of Naval existence they must be borne. The wives and children cannot go around on wrish ps. These problems were looked at from the mother's point of view that of the children and the father. Though overlap with personality problems is inevitable these are to be considered later if they do not relate directly to the separation.

b) *Neighbourhood Problems*

These relate to the acceptance or otherwise of mother into the local social groups. Again although one might have expected more problems here the complaints were less significant than anticipated and only eight mothers felt they could not penetrate the local groups. Rapid mobility gives some feeling of hopelessness at trying to join in but since most postings were rather over a year integration was generally possible. Although some wives found the Devon and Cornwall wives less easy to know possibly because of the higher stay-at-home rate than in other areas of the country generally it was the personality problems which resulted in failure to mix rather than the unfriendliness or disinterestedness of the locals.

c) *Educational Problems*

Here it seemed lay the greatest difficulty in mobility. As the families were analysed the repeated change of school was found and with it signs of failure to keep up or failure to retain interest in lessons. In the 27 children found with definite retardation in school and bear in mind that not by any means all were

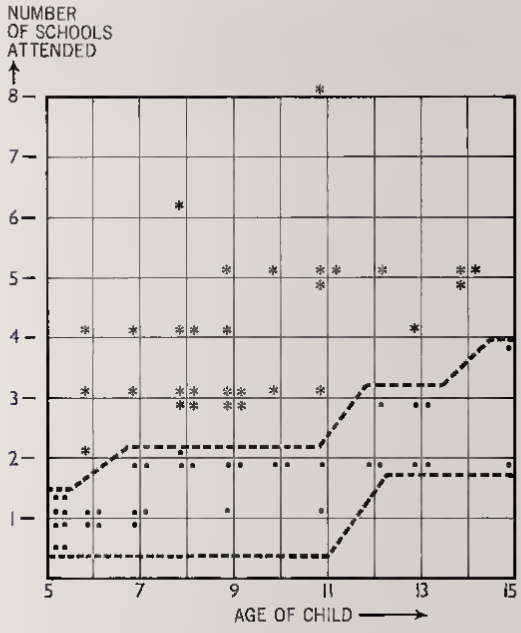


Figure 1

tested for this 18 had a story of having attended more than the usual number of schools (Fig. 1) It might be said that since these children were emotionally disturbed one would expect a high proportion of retardation anyhow but supporting these figures is a clinical impression The story of difficulty in settling learning new techniques and so on is commonplace One child spoke of his experiences with switching between the Initial Teaching Alphabet (ITA) and

Traditional Orthography (TO) as follows He was doing TO in England switched to ITA in an Army School in Singapore back to TO in another school in England and ITA in yet another He finally settled for TO but was somewhat behind in reading by then

Probably more important than the educational techniques is the child s ability or otherwise to make friends Here the introvert child tends to be at a disadvantage and often passes through a phase of attention-seeking behaviour or other regressive behaviour before settling I can think of several recent cases where the children had taken a year to settle and the parents had to contemplate with alarm another move

From the child s angle of course too many adaptational demands result in lack of attention in the classroom (11 cases with consequent retardation in 7) and to truancy or other activity to gain satisfaction within the group Clinically it seems more difficult for the below-average intelligence child to adapt to educational change and there appears to be a greater likelihood of school factors playing a significant part in the symptomatology of these

The incidence of multiple school attendance is illustrated in the graph (Fig 1) displayed with theoretical limits for the average child dotted in There is a wide scatter with the higher incidence of school mobility being most marked at the primary level These children do need special educational attention and the problem is highlighted in one or two local schools which serve the married quarters

For one or two families there may be additional bars to integration in the social group because of language or colour This arises when the sailors marry abroad and bring wives home The three wives in our series coming into this category had all been in England for some years and though things had not been completely smooth their adaptations were not much more difficult than those of the North of England wives coming down to the West.

SEPARATION

Lyon (1967) sees separation in three phases anticipatory duration and re-integration The problems of each phase concern all members of the family but at the Clinic we only see the mother and children in duration although father s difficulties may be mentioned

Anticipation: Only one family described anticipatory phase anxiety and general unhappiness with a marked increase in symptoms of withdrawal and the odd girlish play from the boy concerned depression in the mother and tension in the father In fact this phase is fairly short and perhaps we see children later when the symptoms are developed and the anticipatory phase pales beside the rigours of true separation

Separation: By contrast with anticipation 30 families described symptoms and feelings related to actual separation and these will be considered in some detail

A. Mother's Reactions
B Child Reactions
C The Return

A **Mother's Reactions**. These seem to fall into four main categories

i Difficulty in filling dual role of father and mother
ii Depression at its worst during middle of separation
iii Anxiety over father when he is away
iv Pregnancy

i *Dual role filling* About eight mothers in our series described the strain of trying to be mother and father to the children and this attempt usually led to reactions in the children which did not disappear until the mother became herself once more Usually this confusion arises because when the father is at home mother can be herself allowing father to control the situation in his way When he goes she tries to continue father's techniques of discipline for a while before changing back to her natural methods Lyon describes this very well in his study of US Marines whose families have in addition to cope with the danger of death or injury of the father in Vietnam

ii *Depression* The depression seen in 10 out of 76 of our mothers was also noted in Lyon's study and was related to the middle period of separation This reactive depression was in turn related to a more general maternal depression in 4 cases but in 6 appeared to be a specific reaction to each loss In only one case was it severe enough to recall the husband This particular depression resulted from the young mother's unresolved feelings towards her own mother and resulted in a battered baby Not only was compassionate return necessary in this case but also a compassionate discharge although both parents were very apprehensive over the latter step

iii *Anxiety over father* This was evident in this same family because father found Naval life extremely difficult although good at his job and well regarded and he was hardly able to eat when away from his home Few other wives were anxious over their husbands but found their own problems very demanding.

iv *Pregnancy* This is a fairly natural hazard but one which for Naval wives demands extra organisation because of being left with the children while father goes away Pregnancies often precede or follow periods of prolonged paternal absence

B **Child Reactions.** Turning to the reactions of the children the interesting features are the difficulties in

i Sleeping
ii Attention seeking
iii Stealing
iv Loss of interest in lessons
v Aggressiveness

Incidentally the incidence of enuresis was 12 out of 76 and encopresis 4 out of 76

i *Sleep disorder* Sleep difficulties were seen in the pre-school group and in

young schoolchildren. Mostly they consisted in delay in going to sleep, early waking and wandering, crying and clinging during the night. Unlike Lyon we did not find these disorders were temporary but they continued for much longer than the three weeks he described. In two of these families we had to arrange a compassionate return and in another the mother betook herself to Singapore to ease the strain. It seems that these sleeping problems acting on the already stressed mothers can produce very serious tensions in the family.

A further group of sleep disorders occurs after the separation and is related to changes in family organisation when the father returns. In most cases it seemed an anxiety manifestation: the child remaining awake for long periods or waking and crying. Displacement of the child from mother's bed produced an aggressive reaction rather than a sleep disorder.

ii. *Attention seeking.* Occurring as the presenting feature in 17 of the 76 families this symptom was found in the younger patients especially the pre-school and young school group.

iii. *Stealing.* Stealing of various kinds might have been expected on the basis of the Glueck's work on delinquency. They described a factor of paternal insufficiency as being one of those significantly related to delinquency. The incidence of this symptom (17/76) added to the incidence of other forms of aggressiveness (28/76) and allowing for those who had the two in common (6) accounts for more than half of those referred. Clinically the impression is that the mother, on her own was unable to produce a consistency of care and discipline which the child could accept. It should be noted that stealing will not necessarily present to the Child Psychiatrist and that since it is more likely to be seen by the police, probation department and school teachers the true incidence is probably very high.

iv. *Lack of attention to lessons.* Is related to school changes and to retardation in attainments as might be expected. It is also related to aggressiveness in the children who seem to seek status by violence in the home and in the peer group to compensate for their failures at school. One of the distressing features noted was the way in which the newer educational techniques introduced to promote better understanding of school lessons can because of lack of consistency from school to school result in even less understanding than might have been achieved with all schools using traditional techniques.

v. *Aggressiveness.* The problem of aggressiveness is linked with that of stealing and has been discussed in the context of disciplinary problems of the mother. Unfortunately the symptom does not cease when the father returns, but may even increase as the child tries to continue a temporarily successful adaptation. Twenty-eight of the 76 children were recorded as showing aggressiveness. This varied from temper tantrums at the mildest to violence towards sibs, destructiveness of property at home, bullying at school and violence to peers and coming home. There seems in some cases a strong identification with an aggressive father. In a recent case involving some stealing, violence in the playground and defiance towards his teachers the returned father displayed his own aggressiveness to the

school teacher explaining that he had instructed his son to defend himself with the maximum of violence and justified the stealing by saying that rules especially school rules were made to be broken Again it is interesting to note how many of the sailors who live in a disciplined environment are extremely mild mannered when they return home preferring in some instances to leave all matters of discipline to the mother

C. **The Return**– Other studies on this subject have dealt with the difficulties of reintegrating the father after long periods of absence The situation is in a way comparable with the way in which families close when the aged relative goes temporarily to hospital

On the question of what effects might be seen in connection with the return we looked at changes of discipline affecting the children and the characteristic finding was a very strict father or a permissive father The happy medium was not found very often and the question resolved itself into the compatibility of the marriage partners in the matter of discipline If the father and mother were strict then no change took place on the return similarly if both were permissive Difficulties arose from discrepancies where one partner was strict and the other permissive This difference was found in 24 of the 76 families In a further 5 cases we recorded that the father having been away at the birth of the child and its baby hood showed little interest in the child subsequently Another interesting feature is the competition between father and children for mother s attention Father is described as in need of mothering himself in one of our social histories and this is probably true of others though it was not recorded

i *Financial problems* Because shipboard life gives limited opportunities for the practice of financial stringency father is likely to have difficulties in managing his money when coming ashore Eleven families described poor financial manage ment which not unnaturally led to considerable anxiety and stress in the marriage

ii *Marital stress* Occurred in 22 families six of which were second marriages A further nine families had suffered complete breakup A number of 15 divorces in 76 appears very high although it is difficult to draw a comparison without a control group Superficially it appears that Naval families are potentially more unstable than non Naval ones

iii *Alcoholism* The other large reintegration problem concerned the drinking habits of our group of fathers Heavy drinking sufficient to cause concern to the mother was seen in 10 families and in discussion with the fathers availability of alcohol and cheapness contributed to the problem No true alcoholics were found but the dependence on drink had started and the fathers tended to be violent with the drinking and of course the money spent on alcohol ashore was quite a large slice of the family budget

These then are the environmentally determined factors in the present study of Naval families It is important to bear in mind that the reactions to environ mental stress are not entirely due to the stress but that the environmental stresses

tending to give specific symptoms or groups of symptoms act as a vulnerable personalities It is regretted that the pictures of the personalit[illegible] far from complete especially the personalities of the fathers

PERSONALITY TRAITS

Mothers Maternal depressive illness sufficient to have merited treatment up to and including a stay in hospital was found in 18 of the 76 It is to be distinguished from the temporary reaction during separation often is found in association with the puerperium in which physical effects such as loss of energy loss of contact with the children appetite and sleep disturbance were recognised This condition of itself carries serious implications for the children as does the finding of six mothers with inadequate personality These mothers were particularly helpless when the father was away Where descriptions of the mothers exist in other cases they are mostly described as pleasant adequate individuals affected by circumstances out of their control

Fathers The fathers themselves appear even more sketchily in our notes though appearing stronger Only a limited number of fathers were actually interviewed and of these four had had mental illness at some time, but inferences can be drawn on the basis of the financial and drinking problems

Children The children examined were not given specific personality tests but since in 5 asthma was a preventing feature we may assume there was a constitutional loading for psychogenic reactions in some The pattern of reactions found in these children falls into the usual pattern for emotionally disturbed children except for the relatively large number of aggressive and delinquent children (50 per cent plus) which compares with a rate of 8 per cent stealing and 35 per cent behaviour disorder in the overall clinic figures However our results are selected as reactions to the specific family stress Intelligence range appears to be around the norms for the population and the age range from 1 to 15 with a peak concentration in the 5 to 9 group (Fig 2) None of the adolescent boys problems mentioned by Lyon were seen

Family size From Table I on sib position and sibship it can be seen that these families tend to be large ones and that the affected child is more often than not the eldest Where more than one sib is affected we have not included them both in the series In fact multiple referral was usual

TABLE I
SIBSHIP OF 76 NAVAL FAMILIES

No of Sibs	1	2	3	4	5	6	6	Totals
Eldest	4	14	14	3	2	2		39
Youngest		7	2	-	-	1		10
Other			10	8	3	3	3	27
Totals	4	21	26	11	5	6	3	76

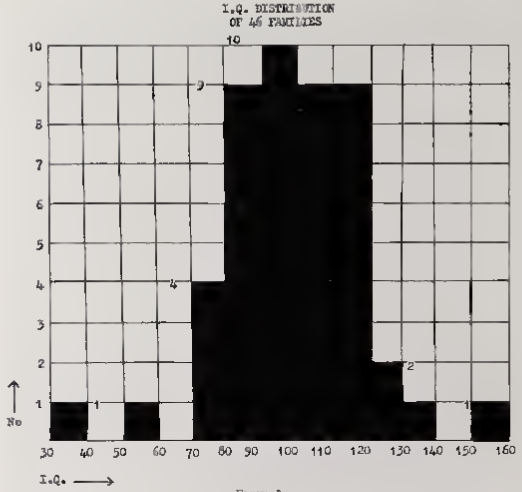


Figure 2

DISCUSSION

The study raises many questions more than it answers but does point to several areas where enlightened action might improve matters The salient areas seem to be firstly in the educational sphere need to introduce consistency in the curricula of children of mobile families and appreciation by teachers of the special needs of these families Secondly in the social sphere, counselling techniques can be applied to ease the pressures of parting and tensions of absence as well as assisting the young father to adapt his mode of life to his family rather than vice versa and help him to be accepted back

Finally and probably most important this study points to problems which need to be explored in the context of a research study on the Naval family rather than on the ones who present to particular places Comparisons need to be drawn with control populations From such a study predictive data could

well be available which might help to prevent some of the difficulties we have seen. In particular it might be possible to incorporate tests of adaptability of the man to the different roles of sailor and loving husband.

ACKNOWLEDGMENT

I would like to acknowledge the interest taken by the Royal Navy in the work of our Clinic to the extent of supplying a psychiatrist who is intimately concerned with Child Psychiatry and who works in the Clinic for two sessions a week. We are grateful for the co-operation received from the Navy where environmental changes have been recommended. I would also like to thank those people who have assisted me so much in the collection of the data for this study.

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Articles

VOLUNTARY DENTISTRY IN HONG KONG

By Peter Moorhouse

On being posted to HMS *Tamar* Hong Kong the dental officer faces a fascinating prospect The social delights of the Colony are well known but work also offers wide variety and interest.

The dental officer is responsible for the dental health of HMS *Tamar's* European and Chinese personnel sailors from visiting ships *Tamar* families and personnel and families from RAF Kai Tak Since the RAF Station is across the harbour I have been lucky enough to have helicopter transport which though common place these days is much appreciated Also by courtesy of the Army I have followed my predecessor by attending the dental theatre session in the British Military Hospital

Besides the routine described above I have inherited three additional spare time jobs One of these the Penetration Squad I knew of in advance through reading a short description (Mathias 1961) The other two are care of the boys at the Hong Kong Sea School and an evening clinic in Wanchai

The Sea School takes as boarders deprived boys aged 14 to 17 and trains them in basic seamanship and care of themselves The boys first job on entry is to make their own uniforms of shorts and shirts which is no mean feat The School is run on voluntary subscriptions and receives considerable overseas support notably from Sweden and America However as it is run on a shoestring many bodies give practical assistance the Royal Navy being one such helper When I first took over the treatment was almost exclusively extractions only The School is situated near Stanley Prison and emergency treatment can be obtained there but nonetheless many of the boys were in actual pain when I saw them

Treatment is given in HMS *Tamar* after normal working hours four to six boys being seen in one session In the past a little conservation had been done and an occasional denture had been made but because of the overwhelming demand on the time available and the fact that most of the boys join the Merchant Service on leaving the School and can then pay for treatment extractions were the order of the day I carried on this work for a while but I was struck by the need to give more comprehensive treatment since of course small holes left one year were enormous the year after and resulted in eventual loss of the tooth

Chinese children of the type treated rarely do anything but ignore dental treatment and oral hygiene, as much as the resulting pain will allow However many have good clean mouths and little or no caries and many others have good teeth buried under a mass of calculus It is common in a 15-year old to see a

moderately clean mouth but with all teeth ringed with a thin line of hard calculus and the four first permanent molars missing or completely decayed down to gum level Even where much calculus is present the gingivae do not appear to have suffered very much A small proportion of boys have terribly dirty mouths and massive decay

In an attempt to raise the dental standard of the boys the ones then attending were given extractions only if in actual pain and more intensive care was given to new entries

Boys enter the School in batches three or four times a year so I went there to check the new boys soon after arrival and classified them into those requiring fillings extractions or both Some 20 per cent didn't need any treatment All the extractions were done at weekly sessions and then as many fillings as possible before the next batch joined the School

It was obvious from the first that the system was not going to provide dental fitness because there still was not enough time to do all the work and since the School was still growing classes were becoming larger At this point I enlisted the help of the St John Ambulance Brigade who now do as much as possible of the new entry routine work at a surgery in their headquarters staffed by dentist members of the Brigade I then started working back up through the School on the boys too senior to be included in the new plan They now get fillings extractions dentures scalings and sometimes gingivectomy When this backlog has been worked off the *Famar* dentist can revert to the new entry treatment when it is hoped that all members of the School as new entries will be made dentally fit.

The Hong Kong Dental Association runs a number of free clinics in the Colony and I assist in one such clinic in Wanchai The surgery is very spartan and the dentist is assisted by a girl who works for a dentist regularly and a coolie woman who needs some watching as she is likely to sterilise in lukewarm water for five minutes and then rub the needles with her dishcloth But she is a good Mrs Mopp

My turn comes round about every six weeks and lasts about an hour Any number of patients up to 20 may turn up and they are mainly children Extractions only are possible

Dentistry in a surgery is all very well but what about working without one? This is the Penetration Squad which for the volunteer dentist, comes round two or three times a year

Shortly after World War II the Hong Kong Government not having enough dental staff to cover the needy population asked the St John Ambulance Brigade to take over responsibility for a mobile clinic using Government money and equipment in order to offer extractions to people of outlying islands and the New Territories

The Squad works every other Sunday throughout the year and consists basically of the dentist, a dedicated Nursing Officer, Miss Nancy Fung San Ping who goes on every single visit and has done so for several years as well as working on the alternate Sunday and one evening a week at HQ and two girls who are junior members of the Brigade. The officer who organises the squad often goes along and occasionally other members of the Brigade.

In the early days of my time in Hong Kong a policewoman also went along to control the crowds!

The dental chair is the folding variety used by the Services and the steriliser is a can of boiling water over a spirit stove. There is a plentiful supply of forceps and elevators but only four cartridge syringes. I have lately taken a box of disposable needles along as this speeds up the work considerably as about ten patients can be given injections in turn and then have extractions again in turn.

When the village to be visited is on an island a Marine Dept launch resembling a small lugboat is used and the journey takes from one to two hours each way. When in the New Territories a small St John Ambulance is used. These vehicles are provided by the Royal Hong Kong Jockey Club which makes large amounts of money from the Tote and entry fee to race meetings and is the Colony's largest benefactor. My first visit was to the New Territories but since I could go there by car anyway, I requested all island visits after that and have thereby visited island villages way off the beaten track where I would not otherwise have gone.

Families can go along and perhaps picnic and bathe after the work is finished providing quite a good day out if there are not many patients.

On a typical day the party moves off on the launch at about 1000 from a public pier in central Hong Kong. Often people come from Kowloon so a stop is made for a few minutes. Everyone is dressed casually and when the weather is fine there is quite a holiday atmosphere. The journey out to the island is usually pleasant for me particularly through the fascinating harbour but Miss Fung becomes seasick very easily. One of my trips was very stormy but the rest have been in good weather. Many island villages have a deep-water quay that we can come alongside but, if not, we unload into sampans and are sculled ashore by a girl or boy where we scramble onto the rocks which the locals have worn smooth with constant use. We are usually met by a boy with a handcart and all the gear is piled on. As it is weekend many people may have travelled by ferry to the same island and crowds of people may swarm over the quay staring curiously at us. On one such day lots of hikers and ramblers disembarked on to the wide part of the pier. Nearer the land the pier suddenly narrowed and a hiker with a rucksack on his back and head turned the other way laughing at his friends fell straight off the edge into six feet of water. Everyone roared with laughter and in the Chinese fashion made no attempt to help him. Apparently this attitude stems from the fact that anyone helping someone in need may thereby have accepted responsibility for the person being helped who may then come to live with the helper! An old Chinese custom so they say.

The village itself is often set back a little from the pier on the edge of the beach at the head of the inlet. We wind our way along the roads which are mere tracks a yard wide perhaps built up in places into concrete causeways. The shops in the village are normally substantial concrete brick buildings with open fronts with wares displayed in the Oriental manner and these are surrounded by wood and corrugated iron shanties and occasionally high and dry old boats which have been roofed over. Most places look dirty as do the inhabitants but picturesque for all that and colourful with soft drink and cigarette advertisements.

We are followed by a crowd of children laughing and jostling. The site to be used for work varies enormously from a covered verandah in front of a shack to a room in a Government Clinic the former is more usual. We unpack and erect the chair and light the stove for the steriliser. Towels are spread on a small table if we can get one and the instruments which have been sterilised before we set off are laid out. A bowl of water is produced and soap and towel laid beside it. During the delay while we wait for the syringes to sterilise the nurse and assistants marshal the patients who with many spectators have been watching from the vantage points around us. Each patient is given a number and a slip of paper with a cross on it to indicate the quadrants of the mouth.



At first I was very concerned about sterility and cleanliness but of course the crunch soon came when there were so many patients that with disposable needles only the needle and the cartridge were changed before re-using the syringe. Many of the teeth to be extracted are abscessed and sometimes pointing so that in a proportion of these there is no choice but to inject on the edge of the abscess area for a slow infiltration of anaesthetic. No antibiotics or sutures are provided. In addition to the obvious badly broken down and painful teeth patients present with impacted third molars (which can only be removed after extracting the tooth in front) displaced teeth (where rough and ready orthodontics is only possible by judicious extraction) and some children with every deciduous tooth flattened to gum level. The numbers attending in one day vary of course but usually average between 20 and 30. Once I had over 60... and that was some day.

At last we are ready. The syringes laid out and I don a short white coat which looks incongruous over my shorts and tennis shoes. The first patient climbs rather sheepishly into the chair. It may be a youth of 16 or so dared by the grinning onlookers to be first or a shy little girl looking very apprehensive and being helped into the chair by her mother. Ten patients receive injections each after a short scan around the mouth by me and a discussion between patient parent and nurse as to which tooth is for extraction. If there is no agreement or masses to choose from I decide and the number or letter of the tooth is noted on the slip of paper. One of the girls is in charge of the steriliser and another scrubs the forceps and elevators after use. My bowl of water is changed periodically as is the soaking towel. Advice to the patient is offered by the crowd and shouts of laughter greet any sign of tears. The patients are mainly children with a sprinkling of adults and the occasional very elderly person with teeth shaking in the breeze. Their wrinkled faces coolie hats and worn black suits give them a picture postcard appearance. Again the ten patients mount the chair in order the tooth pings into the bucket and a pad is placed over the socket. Masses of swabs are used if much bleeding occurs after a difficult or lengthy extraction. It is a great challenge to remove every bit of tooth although occasionally partial defeat has to be admitted but there is always a feeling of triumph as an obstinate root pops up.

On busy days after 20 patients have been seen and the crowd shows no sign of thinning someone remarks that the first few extractions must have been painless. Although quite naturally some children cry I was generally impressed with the stoicism shown.

Eventually there are no more patients to inject. Then the extractions are finished and after a pause to glance round at the odd remaining spectator we pack up and walk back to the pier. Friendly hands help with the gear and friendly waves send us off. The people are mainly fisherfolk with a few farmers to till the tiny terraces and paddy fields. The bays are usually quite full of fishing junks their nets hung out to dry and small children peep out at us from inside. It is now 2 or even 3 pm and we haven't yet had lunch. The nurses have brought curry and rice sandwiches and cakes and we have a pleasant lunch as we return to Hong Kong.

In such a Colony with its teeming population much social and health work is done on a voluntary basis. In this situation where the need is so obvious the Services are pleased to help out but countless civilians also do their bit. It is a privilege and opportunity no one should miss.

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ACKNOWLEDGMENT

My thanks are due to the Joint Services Public Relations Hong Kong for permission to publish the photograph on page 73.

SMOKING HABITS ON THE FAR EAST STATION IN 1967

By H. Russell Mallows

INTRODUCTION

In September 1964 the Medical Director-General (Naval) drew the attention of all medical officers in the Royal Navy to the evidence of the harmful effects of cigarette smoking which was reviewed in the reports of the Royal College of Physicians of London (1962) and of the United States Public Health Service (1964) and to the considerable decrease in the risk of developing cancer of the lung which followed the cessation of cigarette smoking which was recorded by Doll and Hill (1964) in their Ten Years' Observations of British Doctors.

Some guidance was also offered on methods of discouraging the habit and particular stress was laid on the importance of exemplary action by Medical Officers, Nursing Sisters and Medical Branch Ratings.

In February 1967 a survey was made of the smoking habits of personnel on the Far East Station to compare the habits of the medical branch with those of other branches and of the general civilian population in the United Kingdom.

METHOD

A letter was sent inviting the co-operation of all Senior Medical Officers on the Station in the completion of questionnaire forms for 100 per cent of officers and ratings of the medical branch and for separate 20 per cent samples of all other officers and 10 per cent samples of all other UK ratings in the ships or establishments in which they were serving.

The information required in the questionnaire included name, rank or rating, age, average number of cigarettes and cigars smoked per day and quantity of pipe tobacco per week, over a period of four weeks.

Random samples of 20 per cent of officers and 10 per cent of ratings were selected by picking every fifth or tenth medical record envelope (F Med 4) respectively from the filing cabinet, starting from any number from one to five or from one to 10 respectively picked out of a hat.

An excellent response was obtained. Only one medical officer failed to produce completed forms on time owing to an administrative misunderstanding; unfortunately when he did eventually produce them it was clear that there was also a failure to understand the process of random sampling and they have therefore been omitted.

Only one ship produced any frivolous answers and only one officer was recorded as objecting to answering the questions which he considered an invasion of privacy.

RESULTS

The smoking habits of 990 persons were studied. The composition of the group is shown in Table I. Only a few persons smoked pipes and cigars either exclusively or in addition to cigarettes. Apart from the brief details below the

remainder of the analysis is confined to cigarette smoking. Smoker means cigarette smoker and non smoker means non cigarette smoker.

Pipe smoking. Fifteen persons (1·5 per cent) smoked a pipe but not cigarettes, the average weekly amount of pipe tobacco being 2·3 oz (range ¼ oz–6 oz).

Twenty three persons (2·3 per cent) smoked a pipe in addition to cigarettes, the average weekly amount of pipe tobacco being 2·1 oz (range ¼ oz–6 oz).

Cigar smoking. Nineteen persons (1·9 per cent) smoked only cigars, at an average rate of 1·3 a day (range 1 a month to 5 a day).

Twelve persons (1·2 per cent) smoked cigars in addition to cigarettes at an average rate of 0·8 a day (range 1 a day to 1 a week).

Cigarette smoking. Some of the factors which might be thought to influence smoking habits are (i) Branch and Status, (ii) Service Ashore or Afloat, (iii) Age and (iv) Rank or Rating, and these are considered in more detail below.

(i) *Branch and Status*

Table I shows the composition of the group and the numbers of smokers amongst officers and ratings of medical and non medical branches. Though there is no significant difference between medical and non-medical officers there is a large difference between medical and non medical ratings. Allowing appropriately for the size of the samples of non medical officers (1 in 5) and non medical ratings (1 in 10) it can be calculated that 56 per cent of all officers were smokers compared with 78 per cent of all ratings. Thus the proportion of non smokers in officers was double the proportion in ratings.

TABLE I

Number of Smokers amongst Officers and Ratings of Medical and Non Medical Branches

	Total number	Number of Smokers	%
Officers—Medical	33	18	54·5
—Non Medical	179	100	55·8
Ratings—Medical	103	66	64·0
Non-Medical	675	529	78·4

(ii) *Service Afloat or Ashore*

The difference in the prices of cigarettes ashore and afloat is much smaller in the Far East than at home, being approximately 1s. on a packet of 20 (King size) but this might still be thought sufficient to influence personnel ashore at least to cut down and possibly to give up the habit. This of course is not the only difference between life ashore and afloat which may have influenced the figures in Tables II and III.

The total number of medical officers was small and there was no significant difference between them and non medical officers in Table I They have still however been shown separately in Table II because although there is no significant difference in their habits ashore and afloat this shows in marked contrast with officers of other branches and of ratings of the medical branch both of which groups smoke considerably more afloat than ashore Non medical ratings smoke almost equally heavily ashore as afloat

TABLE II

Number of Smokers Amongst Officers of Medical and Non-Medical Branches Ashore and Afloat

		Total Number	Number of Smokers	%
Medical	Ashore	17	9	52 9
	Afloat	16	9	56 3
Non Medical	Ashore	67	31	46 3
	Afloat	112	69	61 6

TABLE III

Number of Smokers amongst Ratings of Medical and Non Medical Branches Ashore and Afloat

		Total Number	Number of Smokers	%
Medical	Ashore	51	28	54 9
	Afloat	52	38	73 1
Non Medical	Ashore	176	136	77 2
	Afloat	499	393	78 7

(iii) *Age*

When the samples were divided into 5 year age groups the numbers of officers and of medical branch ratings were small and no significant or reliable pattern emerged There is interest however in the increase in the 20 24 age group of non-medical ratings compared with the general average and especially with the younger age group as shown in Table IV

TABLE IV

Number of Smokers by Age Groups Amongst Non Medical Ratings

Age Group	Total Number	Number of Smokers	
15 19	135	98	72 6
20-24	226	189	83 6
25 29	147	112	76 2
30-34	75	60	80 0
35 39	68	53	77 9
40-44	21	16	76 2
45-49	3	1	33 4
Total	675	529	78 4

(iv) *Rank or Rating*

There was a general tendency in both medical and non medical branches for seniors to smoke less than their juniors the differences being greater amongst officers than amongst ratings

TABLE V

Proportions of Smokers by Grouped Ranks or Ratings

Ranks/Ratings	% of Smokers	
	Medical	Non Medical
F O Capt Cdr Lt Cdr	45·0	50 0
Lt Sub Lt Mid	69 2	60·4
C P O P O	61 5	75 0
L/rate Able/rate	65 6	79 8

There is a less uniform pattern however on more detailed analysis but the numbers in many of the groups are too small for valid comparisons to be made

Number of Cigarettes Smoked

(i) *Officers*

There were more light smokers (less than 15 a day) amongst medical officers (33 3 per cent) than non medical officers (23 per cent) but 38 9 per cent of medical officers and 44 per cent of other officers who smoked consumed more than 25 a day

TABLE VI

Number of Cigarettes Smoked by Officers of Medical and Non Medical Branches

	Number of cigarettes per day					Total Number of Smokers
	1–4	5 14	15 24	25–49	50–	
Medical Officers						
Numbers	2	4	5	7	0	18
Percentage of total number of smokers	11 1	22 2	27 8	38 9	0	100 0
Non Medical Officers						
Numbers	7	16	33	41	3	100
Percentage of total number of smokers	7 0	16 0	33 0	41 0	3 0	100 0

(ii) *Ratings*

There was very little difference in the habits of the medical and non medical ratings though there was a slightly higher proportion of heavy smokers (25 or more a day) in the medical branch (43·9 per cent) than in non medical branches (38·2 per cent)

TABLE VII

Number of Cigarettes smoked by Ratings of Medical and Non Medical Branches

	Number of cigarettes per day					Total Number of Smokers
	1–4	5–14	15–24	25–49	50	
Medical Ratings						
Numbers	5	6	26	27	2	66
Percentage of total number of smokers	7·6	9·1	39·4	40·9	3·0	100·0
Non Medical Ratings						
Numbers	9	76	242	189	13	529
Percentage of total number of smokers	1·7	14·4	45·7	35·7	2·5	100·0

(iii) *Mean Number of Cigarettes per day*

On average smokers on the Station smoked about 25 cigarettes a day. The figure for medical officers was slightly lower (22·4) but the total number in this group was very small (18)

TABLE VIII

Mean Number of Cigarettes Smoked per day by Officers and Ratings of Medical and Non-Medical branches

Branch	Mean number of cigarettes/day
Officers Medical	22·4
Non Medical	25·0
Ratings Medical	25·6
Non Medical	24·8

DISCUSSION

It was recently stated that three out of four adult males in the United Kingdom are smokers (BMJ 1967). The report of the Royal College of Physicians (1964) quoted a more precise figure of 76 per cent from Todd (1959) which referred to all UK males over the age of 35 in 1958 for direct comparison with Doll and Hill's (1964) group of doctors who were also all over the age of 35. Todd's figure for all UK male adults (over the age of 16) is slightly lower at 72 per cent

Cartwright *et al* (1959) found a similar proportion of 74 per cent of smokers in a random sample of all males aged 21 and over in Edinburgh in 1958 and in 1959 Pygott (1964) found 71 per cent of smokers amongst the 4 828 men in his series of 10 000 consecutive attendances at the Mass X ray department of the Central Middlesex Hospital

Todd's 72 per cent included 8 per cent who smoked only a pipe and 9 per cent who smoked a pipe in addition to cigarettes but the pipe smokers were predominantly in the over 60 age group His latest comparable figures for 1965 (Todd 1966) show an appreciable decrease in the percentage of all smokers to 66 per cent and of exclusive pipe smokers to 4 9 per cent but the same proportion of 9 per cent continued to smoke a pipe in addition to cigarettes

Cartwright and her colleagues did not give a separate figure for pipe or cigar smokers and in their tables of quantities of tobacco smoked they converted pipe tobacco to an equivalent number of cigarettes Pygott found that very few persons smoked pipes and cigarettes with equal enjoyment if they smoked both they were predominantly smokers of one or the other and he classified them accordingly In his age group 15 34 only 1 8 per cent were pipe smokers in 1959 which accords well with the 1 5 per cent in this series but by 1963 his figure had doubled to 3 6 per cent

Until more precise evidence is available of the relative hazards of different forms of tobacco smoking it is important to distinguish between them if possible in any consideration of smoking habits confusion which may otherwise occur in drawing conclusions is likely to be further increased in future if the habit of smoking cigarette sized cigars now being fostered by the manufacturers continues to grow

In this series the 15 persons who smoked a pipe but not cigarettes and the 19 who smoked cigars but not cigarettes formed such a small percentage of the total (1 5 per cent and 1 9 per cent respectively) that it was considered that their inclusion would have complicated the detailed analyses without adding anything of significance and they have therefore been omitted from the tables Only the known hazard of cigarette smoking is considered in detail

The RCP Report stressed the notable contrast between the smoking habits of doctors of whom 50 per cent were complete non smokers in 1961 and those of other men over 35 years of age in the UK of whom only 24 per cent were complete non smokers in 1958 Lynch (1953) however in his study of the smoking habits of the teaching staff of Edinburgh University showed that the proportion of complete non-smokers amongst medical staff (51 per cent) was almost equalled by that of the non medical staff (47 per cent)

In this study there was a similar finding that the proportion of non smokers amongst medical officers (45 5 per cent) was almost identical with that amongst non medical officers (44 2 per cent) Each of these figures was approximately double that of the non smokers amongst non medical ratings (21 6 per cent) whilst medical ratings were in between with 36 0 per cent of non-smokers

Wright (1968) found an even higher proportion (56 per cent) of non-cigarette smokers amongst business executives

TABLE IX

Comparison of percentages of non-smokers amongst Naval Personnel (Far East) and some Civilian Groups

Group	% non-smokers	
U K Males over 16	34 0	(Todd 1966)
Ratings non medical	21 6	
Ratings medical	36 0	
Officers non medical	44 2	
Officers medical	45 5	
Edinburgh University Staff	48 5	(Lynch 1963)
Business Executives	56 0	(Wright 1958)

The proportion of non-smokers amongst ratings of the medical branch is very similar to that of the general male population but amongst non-medical ratings it is some 12 per cent less

Officers have 10-11 per cent more non-smokers that the general male population but 3-4 per cent less than Edinburgh University teaching staff and 11 12 per cent less than some business executives

Both officers and ratings smoke slightly more heavily than the general male population — an average of 25 a day compared with 19

More officers and ratings smoke afloat than ashore but the differences are only slight with medical officers and non-medical ratings

SUMMARY

A survey of smoking habits in the Far East Fleet was carried out in February 1967

The sample totalled 990 persons and included 100 per cent of officers and ratings of the medical branch and 90 per cent of all other officers and 10 per cent of all other UK ratings from all ships and establishments carrying a medical officer

Only 1 5 per cent smoked a pipe but not cigarettes and 1 9 per cent smoked cigars but not cigarettes Detailed analysis was therefore confined to cigarette smokers

The percentage of non-smokers amongst medical and non medical officers was almost identical 45 5 per cent and 44 2 per cent respectively This was about 5 10 per cent below that of comparable civilian groups but double that of all ratings (22 per cent) and considerably greater than that of the general male population in UK (34 per cent)

More non medical officers and medical ratings smoked afloat than ashore but medical officers and non medical ratings showed little difference

The highest proportion of smokers 83 6 per cent occurred in the age group 20 24 of non-medical ratings

There was a general tendency in both medical and non medical branches for seniors to smoke less than their juniors the differences being greater amongst officers than amongst ratings

Both officers and ratings smoked an average of 25 cigarettes a day which is slightly higher than the civilian average of 19 a day

ACKNOWLEDGMENTS

My thanks are due to the Senior Medical Officers of Ships and Establishments of the Far East Fleet for their co operation in arranging the selection of the samples and the completion of the questionnaires I am also grateful to the Commander Far East Fleet for permission to conduct this survey during my tenure of the appointment of Naval Medical Officer of Health Far East Fleet and for permission to publish the report and to Sir Austin Bradford Hill Consultant in Medical Statistics to the Royal Navy for much helpful advice

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A SURVEY OF POST MORTEMS, MALTA HOSPITAL 1829-1838

With special reference to the Cholera Epidemic of 1837

By Paxton Dewar

BACKGROUND

The post mortem register which is made up in a pharmacist's ledger, has its first entry dated 16th January 1829, and contains entries regularly from this date onwards until 6th May, 1838. After this date there are no more recordings, although there is still space in the register. There is no reason stated for the absence of further entries.

All entries are signed by John Liddell, but are in many different hands — presumably those of clerks.

John Liddell (1794-1868), later Sir John Liddell had come to the RN Hospital, Malta, after making his name by his surgical preparations for the Battle of Navarino in 1827. It was for his journal written about this battle that John Liddell in 1832, was made the first recipient of the Gilbert Blane Medal.

He was a graduate of Edinburgh and stayed in Malta until moving to Haslar in 1844 and later on to Greenwich.

In 1855 he succeeded Sir William Burnett as Medical Director General, a post he held until 1864.

There is some discrepancy in the dates of his period spent at the RN Hospital, Malta. The dates given above are according to Lloyd and Coulter (1963); these however do not coincide with the dates on the 'Board' at RNH Bighi.

POST MORTEM RECORDINGS

While describing his findings at post mortem in great detail, using the classical descriptions of the period (see p 85) Liddell does not reach any specific diagnosis, except by inference. Therefore in many cases there was some uncertainty as to the actual cause of death and one had to decide in one's own mind on a specific diagnosis. These decisions were made only after reading all the Post Mortem Reports; this was to enable one to appreciate the style of Liddell's descriptions.

In all cases there is a lack of essential data. The only information about the patient is his name, his rank in the RN, his ship and the number of hours after death that the post mortem was carried out. There are no recordings of age of patients or any clinical signs before death.

These points do not apply to the cases of Cholera which Liddell examined for

in his description of the appearances of the Cholera victims, the terms used led to instant recognition and, indeed, mimic the classical. This can be shown by quoting part of one such post mortem recording —

The smell on opening the abdomen was peculiar and differed widely from the ordinary smell of a dead body and I likened it to fish — the intestines externally looked moist but felt dry, they were particularly the small ones of a rosy hue and felt soft thickened and pulpy.

In another report on a Cholera victim Liddell says, 'The intestines and stomach congested and of the same pinkish hue and doughy feel as in all cases of Cholera that we have opened. Indeed the uniformity has been most striking.

All the post mortems that Liddell performed were upon Royal Naval men or on men involved in the building of the New Royal Naval Hospital' at Bighi.

In one report Liddell refers to the New Hospital at Bighi in an entry dated 5th January 1832. This is the first mention of the new hospital and the date of this entry is nine months before the Hospital was completed 24th September 1832 (Lloyd and Coulter 1963).

FINDINGS

The causes of death determined from Liddell's accounts of the post mortems were divided into major categories five in all these were then split up into smaller more specific categories. The figures obtained were as follows:—

Total number of deaths in the 9 year period January 1829 to May 1838 which underwent post mortem examination = 231

	Death Attributed To		*Percentage of Total*
i)	Respiratory disease	93	40·3
ii)	Cardiac disease	25	10·8
iii)	Abdominal disease	66	28·6
iv)	Skeletal disease	32	13·8
v)	Meningitis	15	6·5

These figures show that the majority of deaths were due to Respiratory Disease and when this category is further broken down it will be seen that most of these deaths were caused by Pulmonary Tuberculosis.

Thus (i) *Respiratory Disease* of a total of 93 deaths post mortem examination revealed:—

		Deaths	*Percentage of Total*
a)	Pulmonary Tuberculosis	76	40·3
b)	Pneumonia	10	4·3
c)	Lung Abscess	7	3·0
ii)	*Cardiac Disease*	25	10·8

It was not possible to subdivide this category

iii) *Abdominal*

a)	Cholera	14	6 1
b)	Tuberculosis	9	3 9
c)	Peritonitis	9	3 9
d)	Typhoid	8	3 4
e)	Post operative complications	7	3 0
f)	Crohns Disease	7	3 0
g)	Gastric Carcinoma	6	2 7
h)	Hepatic Lesions	6	2.7

As the cases of Cholera were all recorded in a period of 3 months and the other categories are all over a period of 9 years the severity of the Cholera epidemic takes on a real significance

iv) *Skeleal*

a)	Fractured Skulls	13	5 6
b)	Other Trauma	13	5 6
c)	Osteomyelitis	6	2 7

Perhaps significant here is the high percentage of the total deaths that have occurred through trauma This reflects not only the somewhat different facilities available for treatment in the early 19th Century from those available in the middle 20th Century but also the hazardous nature of peacetime duty in the sailing fleet

v) *Meningitis* 15 6 5

This category was not subdivided since these cases were the most difficult in which to come to a definite diagnosis

THE CHOLERA OUTBREAK

The first record of death from the disease at RN Hospital was on June 20 1837 and there were 14 recorded Post Mortems on Cholera victims between that time and September 29 1837 This number of 14 is interesting as Lloyd and Coulter (1963) quoted only 5 deaths in 62 cases of Cholera

I was unable to discover a record of patients in the Royal Naval Hospital at that time and thus do not know the number of naval patients diagnosed as having Cholera

The first naval victims to arrive for post mortem were 5 from HMS *Hermes* between June 20 and June 30 1837

There then followed two cases from HMS *Rodney* in July and four cases off HM Cutter *Hind* in August

There was then a period of 1 month with no Choleraic victims in the post mortem room until the end of September when 3 men from HMS *Vanguard* were autopsied and found to have died of Cholera

Men from HM Ships Av[illegible] autopsied during the period June September [illegible] deaths were due to Cholera

In Malta the fear of Cholera first gripped the island in 1834 when the disease broke out in Gibraltar The Malta Government Gazette (1834) states that the aim of the government was to tranquillise the minds of the people of all classes and to familiarise them while the disease was still at a distance

The records show that the main epidemic broke out on the island on June 9 1837 at the Ospizio of Floriana (a suburb of Valletta) but there is some evidence that sporadic cases had already made their appearance as early as September 1836 at Mdina the old capital

There is no doubt that the disease occurred on a large scale in Malta only in 1837

By June 13 the epidemic was advancing and from the original 2 patients at the Ospizio with the disease there were now 27 with 17 fatalities

In Medical History of Malta Cassar (1964) states that the doctors were discouraged and unburied corpses littered the place Eighteen convicts were discharged from prison on June 18 to bury the corpses but they committed so many excesses that they had to be readmitted to prison the next day Meanwhile the epidemic was spreading to other districts and to the Military and Naval Hospitals

Patients were urged to go to hospital as soon as the disease was manifest, but they were reluctant to do this as a rumour was about because of the large number of deaths that the government was killing these people in hospital by poisoning (see later reference to Calomel)

At this time there were two theories about Cholera the contagionist theory and that of the non-contagionists who held that Cholera was an epidemic illness transmitted in the atmosphere its germ being carried by vitiated air pregnant with the miasmas and emanations of Cholera (Cassar 1964)

In July there were 6 286 known cases in Malta with 2 743 deaths The epidemic started to wane in August and by October 11 it had ended completely

A total of 8 785 cases were known to have occurred during this period in a population of 120 000 and there were 4 252 deaths

In the hospitals the mortality rate varied from place to place between 14 and 67 per cent The lowest rates being recorded by the Military and Naval Hospitals

The treatment of Cholera in those times was based on the principle of eliminating the Choleraic Miasma Blood letting and diaphoretics were resorted to Even nurses submitted themselves to phlebotomy to acquire immunity to the disease Diarrhoea and vomiting were treated by the administration of iced water and leeches to the epigastrium Intravenous injections of a mixture of

sodium bicarbonate and sodium muriate were used to replace the loss of fluid and salts However the main treatment appears to have been the administration of vast doses of Calomel Some records show that the purgative was commonly given in doses of twenty grains every half an hour

This last statement is substantiated by Liddell's descriptions at Post Mortem of Cholera victims —

1 'The mucus of the stomach was very abundant and some calomel like particles adhered to it'

2 'The stomach contained no fluid its villous coat was covered with a thick mucus that contained much calomel of its most depending part

Calomel mercurous chloride was allegedly insoluble and was used mainly as an intestinal irritant and as it is recorded as having given comfort to the patients it is thought that it may have acted to change the pH of the intestinal contents and thereby caused death of organisms It is more likely however to have been used as sympathetic or white magic for the suffering victims particularly as the drug was also known as white precipitate

SUMMARY AND DISCUSSION

An old and detailed record of post mortem examinations taking place in Malta from 1829-1838 has been studied Of particular interest are the records of deaths from Cholera since these greatly exceed the numbers given in Medicine and the Navy

As with many records of autopsies the ratio of deaths to post mortems is not stated and hence the figures for causes of death are not absolute and in many the conclusion drawn is only a guess since the data are inadequate

ACKNOWLEDGMENT

I wish to thank Surgeon Commander D O Haines for putting the Post Mortem Register at my disposal for his invaluable assistance in the problems of specific diagnosis and for greatly encouraging me by his personal interest

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ELECTIVE PERIOD IN THE STATES

By James Edward Flood

When my Dean asked me if I would like to spend my summer elective period at the Medical College of the University of Vermont I jumped at the opportunity

If your geography is anything like mine however you will be wondering where Vermont is It is one of the small New England States tucked into the north-eastern corner of the United States along with New Hampshire Maine Massachusetts and Connecticut With a population smaller than Wales and its biggest city Burlington having a population of only 50 000 I wondered whether the medical students there ever saw any patients! As it turned out they do

The Vermont Medical Centre at Burlington consists of two hospitals having a combined total of 750 beds In 1966 the two hospitals handled about 100 000 patient-days As to the medical college it is relatively small by American standards with an intake of only 75 students in each year but is housed in brand new luxuriously equipped buildings They even have full size operating theatres for dog surgery!

It did not take long to find out where their patients came from The medical centre handles cases from Vermont and the northern half of New York State across Lake Champlain It also caters for a year long out-of-state spate of visitors In winter Vermont can boast of having the best skiing area of the eastern seaboard while in the summer the State is filled with hikers campers horse riders and simple vacationers All this combined with an excellent intra State system for channelling difficult cases into the Centre makes the medical practice in Burlington both varied and interesting

Having arrived via a student charter flight into Montreal from London I was allowed to please myself as to the units in which I could spend my time. I decided therefore to spend the first four weeks on the cardiac monitoring unit. That was acute medicine! In that short period eight people died No reflection on the standard of care of course it simply emphasises the morbidity and mortality associated with myocardial infarctions Naturally I rapidly learnt how to handle resuscitation techniques despite different trade names for the drugs and minor differences in terminology

Then followed two weeks on a general medical unit, which was an excellent experience I should explain that during my stay in Burlington I was treated as one of their senior medical students Not only did I find the staff to be enthusiastic teachers but they also expected me to play a full part in the units. That meant ward rounds at 7 am and full 'work ups' on my patients, *ie.* case histories differential diagnoses nursing orders and prescribing drugs Of course all this is checked by the senior resident who does his best to pull the work-up apart but the emphasis is on responsibility In these circumstances it was easy to play a full part and it was most stimulating

Naturally enough I found myself comparing the private health care system with our own National Health Both hospitals in the Centre used private patients for teaching without any difficulty Medicare and Medicaid ensures a high standard of care for those who could not afford private treatment

It was a new experience to have to think of cost when recommending treatment One does not keep a patient in hospital unnecessarily when he is paying at least 50 dollars a day simply to be there!

Time flew by and I soon found myself halfway when I transferred over to the orthopaedic unit Having found this a particularly interesting speciality when I was in Manchester I was keen to try it out in practice It was grand!

Most of the cases were traumatic with a fair sprinkling of general disorders It was interesting to see that the trauma cases were mainly motorcycle and horse riding injuries This is seasonal of course, skiing taking over for the winter months Again I was expected to play a full part in the unit and they were a little put out when I took one Friday afternoon off to go to a party in Montreal That pricked my conscience so I duly turned up for the 7 am Saturday ward round having returned two hours earlier!

It wasn't all work In fact the hospitality was amazing and I got to know the staff very well As we were on Lake Champlain, which is 118 miles long and 10 miles wide at Burlington I was naturally pleased to be invited out sailing The first occasion was a 78 mile race over one week end for the Admiral Mac Donough Cup We didn't do very well but I got to know the Lake, especially the spots where two Naval battles occurred

The first battle took place early in the American Revolution in 1776 As a matter of fact the British won The second one and this is where Admiral Mac Donough comes in happened in the war of 1812 14 On that occasion the Americans won defeating a superior British fleet near the site of the first battle

When my elective period came to an end I had a couple of weeks free before returning home and as I was in the States I couldn't miss the opportunity of visiting a US Naval hospital I therefore got in touch with Surgeon Commander Rawlins RN who is working at the US Naval Research Institute at Bethesda He kindly put me in contact with the Naval hospital at Boston and I was invited to stay there for a few days I then had ample time to look round their blood preservation unit and also to see their Vietnam casualties many of them being marines with land mine injuries

As my next stop was to be Washington where I hoped to visit the US Naval Medical Centre at Bethesda Captain Cuttle the Commanding Officer of the Boston Naval hospital generously arranged a lift down for me on a flight from the nearby Naval Air Station Instead of eight hours by Greyhound bus my journey only took a couple of hours by a Navy C54

I was most impressed with Washington itself especially the National Art Gallery and the Naval Medical Centre While I was visiting the latter I was shown around their tissue culture and procurement laboratories. They are putting a great deal of work into this research as the demand for the various tissues for grafting has risen with the increase in Vietnam casualties

The time came however to return to Montreal to catch my flight home after spending two days at the Man and His World exhibition

Looking back I am convinced that my three months were well spent and that I learnt more medicine in that time than if I had stayed at home

Finally it may be of help to anyone who is contemplating a similar visit to the States to outline the cost of the trip The total outlay came close to £300 £50 of which was spent on the student charter flights £150 on accommodation and the remainder on food and the two weeks holiday

A PORTABLE DENTAL OUTFIT

By Alec F J Smith

The outfit illustrated below weighing 22 pounds 6 ounces has proved extremely useful in the treatment of patients confined to bed in the wards of the Royal Naval Hospital, Haslar and can be used for the less complex dental procedures, including cavity preparation



Contents of portable dental outfit

No attempt has been made to standardise the contents of the case which can be stocked according to the patient requirements but the Wasnor Dental Handpiece motor is the most important inclusion and can be seen attached to the flexible lead from the transformer and the reversing foot control This robust motor is manufactured by Stovell Norris & Co 458 Chester Road Manchester

It weighs only [illegible] directly on to the handpiece eliminating the need for a flexible drive mechanism. The transformer input is from the standard 240 volt main supply.

The inclusion of a headlamp and atomiser has facilitated the work of the Dental Hygienists on their ward rounds. Used hand instruments are placed in disposable paper bags for cleaning and sterilising on return to the Dental Clinic.

Letter to the Editor

Sir,

ACCEPTANCE REJECTION OR PREVENTION?

Travers Morgan (1968) makes two points in his letter both with which I agree One that if the politicians decide that the Navy is to be cut by 10 per cent or whatever we should take the opportunity to get rid of all the malcontents and misfits before we throw out a whole lot of first class fellows who are content and efficient Surely this is commonsense? Second that the vast majority of these are not truly psychiatric cases and should therefore be discharged as unsuitable rather than invalided

In the first four paragraphs of his reply Francis Lamb (1968) obviously agrees but when it comes to the cause and therefore the prevention of these cases he wanders off into a Victorian dream of The Empire on which the sun never sets ! To add to his story until the last war Staff Officers at Dartmouth were expected to be so dedicated to the training of cadets that they were not allowed to have their wives living within 50 miles! Does he really imagine for a moment that this rule could ever be reintroduced?

This is of course an extreme example but when it comes to the cause of these cases it is my opinion that it is to the retention of less extreme but nonetheless out of date regulations that we must look Out of date that is in the context of the society in which we live

No matter how much some of us may regret it the Welfare State is with us to stay The Gilbertian notion of equality the rights of the individual and his freedom of speech and action All this and more constitute the background in which the Service must necessarily exist. A background in which any notion of service to an organisation a cause or a country gets rarer and rarer Fortunately as Francis says we have a high proportion of those who do have such motivation and these constitute his 75 per cent whom we never see in the sick bay

The sociopathic cases that we are discussing are nearly all men who would like to leave the Service We may consider their reasons idiotic, shortsighted unreasonable or ungrateful (for many of them have a training debt which it is considered should be repaid) but they see the rest of our society throwing away solemnly made contracts and see no reason why they should be forced to remain in the Navy against their wishes merely because they signed a piece of paper

We force them to stay and by so doing turn them either into Service criminals who are repeatedly punished by the executive or into psychiatric cases of varying severity

Modern society might well say that the Service is the cause and it should put its own house in order rather than blame the individual

This letter has grown longer than I intended but finally I should like to tell two stories neither of which I can vouch for except that they were both recounted to me recently by very senior officers

The first recounts that Mountbatten when in command East of Suez agreed to the discharge of a malcontent as unsuitable The man's papers showed that he had applied to get out on eight occasions during the nine years that he had served since joining as a boy The great man sent home for all the files and correspondence about this character and as a result found that on all occasions he had been persuaded cajoled and sometimes bullied into staying in against his real wishes Mountbatten wrote to Admiralty pointing out that this man had wasted nine years of his life in an environment which he truly hated and was indeed perhaps entitled to some compensation from their Lordships!

The second story is about the Swedish Navy who had been concerned about this problem for years though of course the numbers involved were fewer I am informed that eventually a couple of years or so ago they took the plunge and with fear in their hearts put every officer and rating on a month's notice either way In three months as they expected they lost 25 per cent of their Navy and all the sociopaths had gone By the end of a year they were back to full strength by virtue of a lot of fine recruits who previously would not have dreamed of joining because of the length of contract required of them

Anything as drastic as this is probably impossible for the Royal Navy but it does seem to me that if we are to compete with our society for a fair share of the right sort of young man we shall very soon have to shorten the engagement period quite drastically and make it much easier for those who change their minds to change their jobs

There are still a large number of Nelsonian officers young and old who find it absolutely incredible that any young man could possibly not like the Navy He must be nuts Send him to a psychiatrist!

Yours faithfully

L G LE CLERCQ

Surgeon Captain RN

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Reviews

NELSON AND HIS SURGEONS By P D Pugh OBE FRCS Pp [illegible] illustrations Edinburgh and London E & S Livingstone Ltd Price 30s net cd 15s paper bank nd Postage 1s

This is a first rate work of exceptional interest to students both of Nelson and of medical and surgical history The book of 68 pages, is mainly of admirable illustrations with their descriptions in the text It shows what illnesses and wounds the Admiral had and Indicates his relations with Surgeons of the day We cannot fail to be amazed at the advances which medicine has made in the past 150 years

The main inspiration for this book was provided by an exhibition at Haslar in April 1967 when the British Orthopaedic Association met there Among many other notable exhibits were the bullet which was responsible for Nelson's death at Trafalgar and William Beatty's instrument case with its bone saw bullet extracting forceps and amputation knife

A reviewer of this book in The Lancet has suggested that Nelson was accident-prone and that his relations with his doctors were neurotic From the comfort and ignorance of the modern armchair it is evidently possible not to be aware of the true circumstances of the seagoing man in Nelson's time By the time Nelson was thirty one he had assisted at four fleet actions three with frigates six engagements against ballistics unarmed boat positions and the mystery of three towns He had had some form of hemiplegic illness scurvy the loss of sight of his right eye and partly of the tip of the right arm with a painful phantom He held his mind in action and was a target for any musket that was fired When his turn for amputation came he had to withstand it made operation without anaesthesia doing with a cold knife and a tough jaw In a rolling limited almost totally dark ship Nurses and infirmaries were I called indiscriminately And when his end came he had sustained broken ribs, a severed pulmonary artery fractured spine and total paraplegia with severe foot pains These details refer to only two of the causes for his contacts with doctors Is this really a description of accident proneness or amnesia?"

As Mahan states, the decisive supremacy of Great Britain was seen proven beyond all question or competition was Nelson's great achievement Surgeon Commander Pugh's monograph enables us to understand the historic background of this achievement to understand how at a critical stage of British history one man managed to survive the dangers and hardships of sea life and the mortal hazards of medical treatment to remain security from attack, supremacy over a tyrant and a tradition of dauntlessness which lasts to this day

WG

SURGERY OF REPAIR AS APPLIED TO HAND INJURIES By B K Rank A R Wakefield and J T Hueston Third edition Pp xv + 350 Edinburgh & London E & S Livingstone Ltd Price 75s [illegible] 6d postage

This worldwide acclaimed of the first edition of this book owed as much to the informing zeal of its first authors as to the obvious truth of the doctrine they preached In the interval national societies devoted exclusively to the surgery of the hand have appeared and the present edition incorporates the fruits of their researches into anatomy and function as well as the newer techniques derived from their experience The book has been extensively rewritten and bears the character and stamp of Mr J T Hueston the new co-author who has already established an international reputation in the field of hand surgery You all admire the same features with the original objective of attaining the best possible results through sound knowledge of the anatomical and technical considerations underlying every hand problem

There is a new chapter on the incidence causes and prevention of hand injuries Anatomy too gets the attention it deserves and it is perhaps a commentary upon the rate of recent advances that some of the most interesting new work on the palmar fascia has not yet reached the pages of such a notable work. Emphasis is still placed upon regional analgesia with brachial plexus block taking pride of place although the authors are now more ready to acknowledge the advantages of general anaesthesia which most surgeons in Britain prefer It is however surprising that with the accent upon regional analgesia no mention is made of modern intravenous analgesic techniques

Surgeons will nonetheless appreciate the systematic [illegible] surgical [illegible] which always treatment to be described in terms of type immunity and [illegible] is also a timely warning about self admired and fanciful [illegible]

As usual the publishers have revealed their happy knack of presenting excellent work in an elegant and readable manner at a price many surgeons can afford J W

FUNDAMENTAL TECHNIQUES OF PLASTIC SURGERY By Ian A McGregor Fourth Edition pp xi + 298 Edinburgh and London E & S Livingstone Ltd Price 35s Inland postage 1s 6d

If there is little that is new in this fourth edition of Mr McGregor's practical handbook it is because the author produced a classic at his first attempt This book remains the model of clarity brevity and succinctness which has won it its deserved position as the finest primer of plastic surgery that has yet been written Its unique invigorating style and pertinent illustrations will captivate the interest of the busy general orthopaedic or maxillofacial surgeon confronted with the problems of providing skin cover for the defect which he has created or perhaps intends to create He would be well advised to buy this small book and master the sound techniques advocated therein if the desires to do the best for his patients

It is evident, however that Mr MacGregor's preoccupation further has failed to provide the accident surgeon with a skilful précis of the most satisfactory modern methods used in the treatment of regional injuries at the expense of less essential information of earlier editions It is just a pity that he was unable to find room for a word about some of the island flaps which have recently proved so successful in the closure of the huge defects left by radical excision of malignant lesions of the mouth and jaws J W

MINOR SURGERY By David Kyle Pp viii + 323 London Butterworth & Co (Publishers) Ltd Price 75s

At first glance this book would appear to be a Byes Surgical Handbook for the general practitioner and as such useful to the dentist in the small ship It is basic stuff written in basic language so that when Dr Kyle talks about a finger for instance and describes primary callus as a typical phalanges joint everyone knows what he means There is a correct emphasis upon the principles of wound excision and closure with which no-one would quarrel and it obviously takes a general practitioner to describe the different lesions resulting from human and animal bites and the various types of foreign body encountered in college hospital practice although one would like to see them much more ruthless about gunshot wounds

When however Dr Kyle extends his surgical interests there are many disquieting suggestions such as the treatment of gangrenous injury by CO snow or trichloracetic acid and is the treatment of cancerous tuberculous glands really only a matter procedural Not many ophthalmologists would be happy about the section of the eye nor many general surgeons upon the removal of lumps in the breast while the treatment of arterial injuries would appear to be to ligate a main vessel Dr Kyle also makes observations upon the primary repair of tendons which would shock those hand surgeons who have made a special study of the subject while some of the advocated orthopaedic techniques have now been discarded

The problem with this book is that the author does not appear to recognise the limitations of primary minor surgery nor the responsibility of the doctor who first treats a man to ensure that specialised procedures are carried out by experts in specialised centres It is therefore not a book which can be unreservedly and indeed many well proven dangerous in the hands of the untrained or partially trained casualty surgeon in general practice who would be better to stick to Eye J W

SURGERY IN THE ACUTE ABDOMEN By John A Shepherd VRD Second edition Pp xi + 741 Edinburgh and London E & S Livingstone Ltd Price £5 10s 0d 4s 6d postage

In this streamlined version of Mr Shepherd's unique and authoritative work historical notes and case histories have been omitted and the bibliography tersely abridged However those of us to whom the first edition was given pleasurable as well as informative reading will regret the disappearance of Mr Shepherd's personal anecdotes recounted in his own inimitable fashion and more readily remembered than the recital of abdominal features

common to orthodox surgical —ffing. Presumably the increasing cost of medical books has dictated changes which are not confined to the text and it is noteworthy that the price is higher in spite of the reduction in size which has also been achieved at the expense of the more agreeable type setting of the earlier edition.

Nevertheless the book remains a practical and reliable guide in the acute abdomen. It is comprehensive certainly. Nothing is omitted. Incidence and aetiology are well reviewed. Symptoms including the uncommon are fully described and only occasionally are clinical signs less adequately recorded than one would perhaps wish. In a book of this size there are bound to be points of controversy, particularly in the field of fluid and electrolyte balance but Mr. Shepherd wisely steers and has chosen to lay down empirical guidelines rather than to indulge in lengthy discussion upon the basis of laboratory estimations which may not be immediately available. On the other hand it is surprising to find that after so much recent work on the pharmacological action of shock treatment by Noradrenaline is still recommended a form of therapy now considered to be contraindicated. Yet the chapters on the Pancreas, Intraperitoneal, Retroperitoneal and Gastrointestinal Haemorrhage take cognisance of the recent vast literature on these subjects to provide a clear understanding of the principles which should govern the management of such conditions.

Mr. Shepherd who is a consultant surgeon to the Royal Navy is to be congratulated both upon the content and character of this latest edition which must now be regarded as a classic and should become the companion of all who are called upon to undertake the surgery of the acute abdomen.

J. W.

RECENT ADVANCES IN MEDICINE. Edited by D. N. Baron, M.D., D.Sc., M.R.C.P., F.C.P.ath. N. Compston, M.A., M.D., F.R.C.P. and A. M. Dawson, M.D., F.R.C.P. Fifteenth edition. Pp. x + 423 and 92 illustrations. London: J. & A. Churchill Ltd. Price: cloth 65s., paperback 45s.

It is such a pleasure to see the continuation of this book under its new editors for the immediately previous and present editions filled the long gap between 1952-1964 when there were no publications. In this edition there are thirteen chapters with a number of combined contributions towards a certain number of these. The total contributors number sixteen and as subjects dealt with in the last edition have not been included on this occasion there has been as a result a complete change of authors. The chapters are critical surveys of important subjects covering a variety of topics wherein advances have been made in the past few years.

If certain subjects are mentioned below this does not indicate that they are necessarily academically or instructively superior to the others but reference is made to chapters on computers in medicine, poisoning, diseases of muscle, disorders of coagulation and of the adrenal and pituitary glands, iron metabolism, leukaemia, hypertension, cardiac infarction and restitution and environmental factors in disease.

This book can be recommended to senior undergraduates and graduates in all walks of life in so far as attempts have been made to keep them abreast of their studies. As all subjects cannot be covered in one volume it is essential that the editors attempt to reproduce the editions every 3-4 years for as complete a coverage of recent advances in medicine as is possible.

L. G. T.

DIAGNOSTIC METHODS. Edited by John W. Mills, M.R.C.P., D.M.R.D. Pp. 176. London: Butterworths. Price: 25s.

This is a new volume of pocket handbook size, with seven chapters contributed by the editor and six colleagues, each specialists in their own fields. The chapters cover chemical pathology, bacteriology and virology, haematology, nuclear medicine, diagnostic radiology, lung function, EEG and electromyography.

The book has been produced as a ward or bedside manual for quick and easy reference and should be extremely useful to senior nursing staff, clinical students and junior hospital staff. It is aimed at helping the young clinician to select the correct investigations to be carried out on each patient, to understand the indications and limitations of same, the required preparation for the test and the information which can be expected from the results.

Inevitably in a book of this size and scope only the main details are included and therefore there is an adequate list of book titles for suggested reading which can be found at the end of each chapter.

The contributors are to be congratulated on the academic standards of their chapters in this initial volume, and it remains to be seen whether an expansion of the contents can be made justifiable without clashing with some of the larger books giving details of practical procedures in clinical medicine and surgery. This handbook can be recommended as being of good value for the selected groups of personnel as stated above and it is hoped that it will be found in a number of white coat pockets.

L. G. T.

[illegible] Principles [illegible] Practice of Medicine By Sir [illegible] Davidson MD FRCP LLD FRSE [illegible] past and present members of the Staff of the Department of Medicine, University of Edinburgh and Associated Hospitals Ninth Edition Pp xv + 1341 [illegible] and London E & S Livingstone Ltd Price 45s + 4s 6d postage

What more can be [illegible] say about this popular [illegible] excellent medium sized and priced textbook of medicine [illegible] in its ninth edition only [illegible] years after its first publication? Every two years [illegible] each new edition is produced [illegible] section is practically revised and brought up to [illegible] date on this omnium in consolide like did many have been made to the chapters on Nutritional Disorders Diseases of the Blood Pneumonia and Pituitary Tract and to the section on Psychological Medicine

For our friends in the underdeveloped countries a paperback edition combining this book and its Tropical Diseases supplement is available at a reduced price

It is needless to say that nearly all clinical students human officers registrars and candidates for higher examinations are aware of the existence of this valuable book and its merits as it provides an excellent background for the discussion of the essential principles of clinical medicine before proceeding to higher more specialised studies

As stated previously regarding former editions this monumental book of basic medical teaching cannot be faulted It is a must for all students of medicine throughout the world and for years to come

LGT

Tropical Diseases By F J Wright MA MD FRCP (Edin and Lond) DTM & H and J P Bland MD FRCP(Edin & Lond) Third edition Supplement to the Ninth Edition of the Principles and Practice of Medicine Pp 176 Edinburgh and London E & S Livingstone Ltd Price 10s 6d + 10d postage

This is the Tropical Diseases Supplement mentioned in the review above and available as a small separate soft bound volume It strongly upholds the standards of the larger book and mentions many things necessary for a study of the broad principles of tropical medicine without the details for specialised study

This supplement cannot be studied fully without the parent medical book as several disease conditions mentioned in the latter eg malaria amoebiasis, ascariasis, laemiasis etc have been omitted deliberately from it Nevertheless this is an essential valuable little supplement, giving full value for money

LGT

Investigations in Clinical Medicine By G R Burston MB ChB MRCP P 165 London Lloyd Luke (Medical Books) Ltd Price (soft cover) 75s

As the author states in his preface this pocket book has been written to help the final year medical student the newly qualified doctor or colleague from overseas to decide which investigations to perform in order to confirm the clinical diagnosis It discusses different investigations for common conditions found in general medicine and suggests the possible conclusions that may be drawn

There are 32 chapters, varying in size from 2 to 3 pages each in the case of pneumothorax systemic lupus [illegible] to 9 to 12 pages in anaemia bleeding and common disorders No index is really necessary in this type of book but what is the value of a 5 line paragraph describing Stevens Johnson Syndrome in this context regarding investigational procedures? Or of an attempt at the simple interpretation of electrocardiographs in 10 stages covering 4 pages?

The reviewer nonetheless think this small book may find its way into the whim mat pocket of the clinical student but cannot recommend it for qualified and junior hospital medical officers who must be familiar with more clinical and investigational details than can be found here For better for the latter to purchase slightly larger book nesting double this price for which there are two excellent ones available describing practical procedures which may not slip easily into the pocket but which will give the doctor all the answers that he or she requires

LGT

Textbook of Medical Treatment Edited by Sir Dennis Dunlop BA MD FRCP(Edin and Lond) LLD DSc Stanley Alstead CBE MD FRCP(Edin Glas and Lond) and Alaster Mcgregor BSc MD FRCP(Edin Glas and Lond) Eleventh edition Pp xii + 720 Edinburgh and London E & S Livingstone Ltd Price 75s + Home postage 4s 6d Export postage 5s 6d

This popular and well established textbook of medicine and treatment is now in its eleventh edition 2½ years following its predecessor and with the usual interval between succeeding editions The whole book has been extensively revised and two short new sections have been added on Anticoagulants and Ill health due to Drugs In this edition the most con

specious change is the setting out of the text e double columes a format being increasingly adopted te these latger textbooks with page size 10 ie × 7 e

This is ol coerse a book whose coentributets ceme from the Scotish Schools with a total of 34 emieeet enesnitents each oe eethority te his own specialty The popelenty of this detailed volume oa Therapeetics te eleical eedeieee segtests thet it remains the best textbook on this subject eetiendy oe the market although thee re some eew books from the Eeglish schools eow eveilable which may well compete for popelarity in the eeet leture

It is diffieult to feeli this well esteblished textbook aed lat easier to emplement specific authors on idividuel chapters or sections of wh ch there etc 29 e this volerne Particelarly stimulating ate the sect ons oe Disorders al the Blood Diseases of the He rt aed Cireelatioe Disturbaeces te Weter aed Electrolyte Balence and Acid Baye Equeib re em aed the Chtonic Rheumatic Diseises How refresh eg it is to eote all the minetest details of the applicatioe of Forced Dieres s te the mynagemeet of barbiturate poisoeing aed of the treitment of salicylate and rioe over dosage These ere hul e few of the shrikingly well documented sections detected by the reviewer te this textbook oe the prine ples of general medieal treatmeet

This book should form ae integral pert of the library of every medieal practitioner both wihle and outside the hospital environment Iteni his stedenthood to inevitable re hiteretect al the eed of a loeg eheical eareer is eeeh sneeessive edition will tema e e mine of information L G T

CLINICAL GASTROENTEROLOGY By F Avery Jeees CRE MD FRCP J W P Gemmel MS FRCS and J E Leneeid Jooes, MD FRCP Scoeed Edit oe Pp 888 Illustrated Oxford aed Edinburgh Blackwell Scientic Peblie tions Pr ce £6

The first edtioe of this book appeered ie 1960 aed is popelarity wes seeh thet it wes reprieted ra the followeig year and appeared re e Spaeish edtioe ie 1963 Now we welcome the second edition of whet has become the standard textbook on gestreenterology ie this coeetry Dr Avery Jooes aed Mr Gemmel have beee jo eed by Dr Leeeeid Jones as co-euthor and in this very rapidly developieg subject the text has had to be esteesively rewritten

Modern gastroenterology owes much to the uetiring work of Dr Avery Jones and this hrok is an inetitution of the practice at the Central Middlesex Hospitel aed St Merk's Hospital where Dr Avery Jones eed his colleagues heve beee respeesible for estabi sh eg departments with ea enviable reputetee for eoestructive research Yet ihen approach is eh ical eed ee eee can fe l to both enjoy and benefi from browsing in this hok which gives an ep to date aceeeel of the aethors experience while at the same time ter ueweg the world wide literature

New radiological techniques eed more recent diagnostic procedures neeledieg small bowel biopsy have peshed forward eur keowledge of the structire aed function of the gastrointestinal tract and so permi ted a eiete ncecurate assesmeet of d sease processes eed their treatment Much of the eheical work of the general physeeie and surgeo e mest eeeessarily be eneerned with gastroenterological problems ted here both will hed eeeerse reform it ee with ee excellent bibliography at the end il each chapter Tl is volenie should be in every hookshell J M C

BASIC PSYCHIATRY By Myre Sim MD DPM and F B Gindre MB ChB DPM Pp v + 262 Edinbergh aed Loedoe E & S Livieg tece Ltd Price 25 + Is 3d postage

The plee of the book follows a geestoe aed eeeser method of espositoe The questioes ere deae eed the eeswers ire pleese hrid ted yet eompthens ve Such a method presupposes a knowledge of the subject and is therel ire eet seitable is te ieteedeetory textbeok

Its teal velee is le helping the rev ver of psychiatry before examinations When feilures in examinatioes ere alloe due to poor techeique le answer eg questioes rather thae a real leek of l ecirel keowledge such eo rd s valuable This book can be confidently recommended to thos e eavieg for the Diploma ie Psychological Medieee aed s imilar exemeatioes All such a modest price it is within the reach of all post gradiate studeets D H M

PRINCIPLES AND PROBLEMS OF ISCHEMIC HEART DISEASE By Tinsley R Herrisoe MD and T Joseph Reeves MD Pp 474 Chicago Year Book Medical Publishers and distribe ted ie UK by John Wiley aed Sons Ltd Baffins Lane Chichester Price £9 7s 0d

Recent advaeces ie cardiology hve teeded to do eteeh to eneleve those without a speeial iteresst ie the subject, and eltei a profeseor of pehlieat oes emphesesng the value of speeel revestgatioes it is a pleesure to welcome this very eiteeral approach to ischeeme heart disease

Coronary artery disease will inevitably become the personel problem of many il ns as well as of our patients it is therefore imlarisi-eg to feed thei nee of the authors experienced a myocardiel refereeoe when the book wes almost eompleted end his own experieeees led to meeh rewriting Such first haed information can only help to make one appreciate the fears ted the hopes of those suddeely afflicted by the symptoms of heart d sease

Dr Harrison and Dr Reeves have from the College of Medicine Centre of Attitude adopted a conventional approach with chapters on the internal general and immunological aspects physiology pathophysiology and presentation of each system but there is a refreshing emphasis of clinical myocardial infarction and heart failure each chapter is with a very adequate though largely American bibliography It is refreshing to find in the introductory chapter the author's hypothetical conversations between physician and patient which emphasise the necessity for a positive approach to those shrunk down by ischaemic heart disease The diagnosis of coronary artery disease is not always unanimous even after exhaustive investigation and it is well to remember that to some patients that we do not implant unreasonable and unwanted heart failure minds thinly disguised reassurance and in this present state of our knowledge they must get it

Few can fail to enjoy this eminently readable volume which should be invaluable to those between academic cardiology and real common sense J M C

FRACTURES AND ORTHOPAEDIC SURGERY FOR NURSES AND PHYSIOTHERAPISTS By Arthur Naylor ChM MB FRCS(Eng) FRCS(Edin) Sixth edition Pp xvi 394 300 illustrations Edinburgh and London E & S Livingstone Ltd Price 40s net 3s postage

Mr Arthur Naylor who is Consultant Orthopaedic Surgeon at the Bradford Royal Infirmary wrote the first edition of this volume in 1945 That it has now reached its sixth edition is evidence of the esteem in which it is held in nursing and physiotherapy schools throughout the country This edition is graced by a foreword by Sir Frank Boldsworth in which emphasis is laid on how much success in orthopaedic surgery depends upon the close co operation between the surgeon the nurse and the physiotherapist The skill of the nurse and physiotherapist cannot be acquired without a clear understanding both of the nature of the particular disease or injury and of the orthopaedic technique employed in its treatment This volume will without doubt, assist the nurse and physiotherapist in acquiring such knowledge and skill In the present edition the opportunity has been taken to revise and expand the sections dealing with spina bifida acute osteomyelitis tuberculosis of bone and the surgery of rheumatoid arthritis and osteoarthritis There are over 300 illustrations of high quality and the production is of the usual high standard associated with the name of E & S Livingstone Ltd At 40s it is a must for orthopaedic nurses and physiotherapists, and will also be of value to the medical student and house surgeon P D G P

TEXTBOOK OF PARASITOLOGY By Hing H Nojarian PhD Pp xi 155 Illustrated Edinburgh and London E & S Livingstone Ltd Price 58s net 3s 5d postage

This work sets out to present the simpler aspects of parasitology for medical students For completeness the author includes parasites of the skin venomous reptiles fish and insects The morphological information is clear briefly expressed and the range of references to this aspect of the subject is well chosen Much of the English literature is carefully selected Many of the line drawings are excellent but some particularly the more minute ones seem to have little value as Figure 13 of Creeping Eruption which could easily be mistaken for vacuoles in tissues Some of the terminology is a little dated for example, it is confusing to use of the terms leishmania and leptomonas instead of the new conventional amastigote and promastigote

The author has chosen to classify parasites under chapters dealing with the tissues of the body where the main symptoms of the diseases caused by them are manifest This arrangement appears unduly artificial the chapter devoted to intestinal parasites and also in Chapter 5 as liver parasites a tissue parasite This leads to a certain degree of confusion Similarly the pork tapeworm is fully described as an intestinal parasite and in its morphological aspect seems relatively unimportant not I consider finds some 40 pages further on in relation to cysticercosis Exposition is uniform and classification often difficult but I see no reason to present to undergraduates readers a guide to any disease process it is essential that the pathological processes arising in such a disease should be readily available in one section if the student is to appreciate the natural history of the disease in question

Though there is plenty of elementary information in the work there is little fundamental treatment It is sad that a Biologist should write a work for medical students with so little reference to the biologically exciting aspects of parasitology such as the intimate relationship between host and parasite Indeed if one is to level criticism at this book it would be that this exciting and essentially alive subject is here presented in too static a form and therefore appears dull P I P

SCIENTIFIC AND CLINICAL MEDICINE IN INDIA By C E Beaumont MA DM FRCP Pp 182 London Lloyd Luke (Medical Books) Ltd Price 30s

To enclose the ambitious compass of the title with in the 175 pages of large print in this pocket sized paper-back would mean the utmost gamut of the students and practitioners to whom it is addressed The author is quite undaunted by the magnitude of the task tossing it off in a mere ten chapters What is more having devoted one promising enough to the Art of

Medicine and entitled [illegible] It still has the confidence to squander a third on idle Thoughts With a few [illegible] Chiropodists and a very few on Computers in Medicine half the book is done albeit [illegible]

It is the first half of the book which seems intended to be scientific stirring with chromosomes genes and their abnormalities A glossary of terms is useful but of such brevity that Metabolism is dismissed as A fairly normal cell division Condensation is followed by confusion We are told that there are two types of porphyrin Wherengion four are described subsequently that renal glycosuria may develop into true diabetes mellitus A merry quip enlivens later pages What do you know about thalassaemia major and minor? Nothing Sir they were not at Hollow with me Ho hum!

It all becomes clear that Dr Beaumont does not worship at the shrine of science and he finally gives the game away in his conclusion on auto immune diseases A set of speculations where one man's guess is as good as another's This will irritate many readers So may the clinical cases with which he illustrates his text and in which he sheds the shackles of brevity even allowing himself comments on the prevailing weather but I found them the best part of the book They are chatty amiable and diffuse but they inadvertently reveal the indefinable skills essential to a physician One such in the author's own gift for remembering experiences hitherto

They show too and perhaps this is the but ten of his tale that the doctor confronted with a really difficult case need expect no comfort from laboratories and still less from computers If he knows the right question to ask he will make the diagnosis without one If he does not he may as well go home.

T R W H

Noise and Man By William Burns. Pp x + 336 London John Murray (Publishers). 50 Albemarle Street Price 30s

Without hesitation or hum the reviewer places this book as the number one reference book on the subject of noise and its effects on man This man is particularly happy coincidence in that Professor Burns is the Royal Navy's Civil Consultant in Physiology and Chairman of the Hearing Sub Committee of the Royal Naval Personnel Research Committee

The book is a masterpiece of careful planning and layout, of accurate but readable phraseology and of meticulous indexing and referencing It is supported by eleven useful appendixes and a profusion of clear illustrations With printing paper and binding up to the same quality as the contents it is except on silly good value at its very modest price

As described in the preface the book is an introduction to the subject of noise and its effect on man but it can say slightly complicate me It covers annoyance interference with conversation hearing and sleep effects on efficiency of work and its potentially harmful effects particularly on hearing Thus, in naval medical circles it should find a valued place on the bookshelf of every specialist in otolaryngology or occupational medicine outside these circles it should have even wider leadership

If criticism be looked for the only disappointment felt by the reviewer was the scanty attention given to the legal aspects of noise and annoyance and noise induced hearing loss and to the engineering and architectural control of noise But then an author has to limit the scope of a book somewhere and these are but fringe interests

R R A C

Vertebral Manipulation By G D Muntland Associate of the University of Adelaide Contribution by D A Brewerton MD MRCP DPhysMed Second Edition Pp x + 179 fully illustrated London Butterworths Price 68s

This is the second edition of a book already widely recognised not only as an important guide for physiotherapists but also for doctors. Throughout the volume the importance is stressed of a thorough assessment and examination by the physiotherapist before treatment is begun and repeatedly during a course of treatment This is as it should be. Lack of success and sometimes disaster are the just rewards of those who subscribe to the view that the only requirement for effective manipulative treatment is the skill of the technique The work is well written and lavishly illustrated with excellent drawings demonstrating the techniques of mobilisation It should be required reading for physiotherapists and is reasonably priced at 48s

P D G P

Textbook of Physiology and Biochemistry By G H Bell BSc, MD(Glas) FRCP(Glas) FRSE T N Davidson CBE MD DSc FRCP (Glas) FRS and H Scarborough PhD(Edin) FRCP Seventh edition Pp 1218 + Index with many figures and photographs some in colour Edinburgh and London E & S Livingstone Ltd Price 80s Postage 4s 6d

This well known textbook in the combined work of a biochemist physiologist and medical clinician It presents a well balanced understanding of the subject in relation to clinical problems.

This book has been extensively rewritten particularly those parts concerned with the organisation and function of biological systems at the molecular and atomic level.

The chapter on the structure and function of nuclear proteins and the transmission of the genetic code are well presented. The partial use of colour in the diagrams in this section is an excellent aid to understanding of the text.

The section on the blood is comprehensive and includes the most recent concepts of coagulation and fibrinolytic mechanisms. Current ideas of clinical importance such as the prevention of Rhesus immunisation in post partum women are mentioned.

Acid Base balance is fully covered in ten pages. The excellent figures and tables have been well chosen to enable the reader to understand the text. The Astrup procedure for the measurement of blood pH is discussed. Throughout the book the subject is presented fully and concisely but when the physiological processes are still not fully understood no attempt is made to present the various conflicting theories, thus the mechanism of transfer of iron or Vit B12 across the intestinal mucosa is not mentioned.

The references at the end of each chapter covering all aspects of the subject are recent some referring to 1968 publications. The index is good.

This book being a comprehensive work covering so large a field is primarily for the preclinical student. It is an excellent information book for the clinician and only for detailed specialist information will it be necessary to read further into relevant subjects.

W W

THERAPEUTICS By J. G. Lewis, M.D., M.R.C.P. Pp. ix + 180. London: English Universities Press. Price 20s. (32s. Library Edition)

No other book published in the past 20 years makes such a practical contribution to the safety and facility of medical practice.

Enormous therapeutic power has been conferred upon the profession by the wealth of valuable modern drugs but much has several analogues and all have one approved and numerous proprietary names. The majority of these names, mixtures and doses is a daunting, test of memory and their best employment is only learned by experience. Unfortunately in life time of practice is insufficient to provide adequate familiarity with the full range, which increases almost geometrically and as a result many doctor rightly admits an armamentarium of these drugs with whose virtues and limitations he is best acquainted.

This work of great use to doctors and nursing staff, however, may involve them in the use of any ethical preparation and the most rational memory is often at a loss. The resultant frequent need to refer is not new. Many sources are available. Textbooks of pharmacology and therapeutics are abound. Official publications such as the NF and BP are excellent. MIMS is used. None is satisfactory. Their contents while ideally suited to their various purposes are excessive, inadequate, inaccessible or irrelevant for this particular need.

The need is now mercifully and opportunely fulfilled. In these 150 pages much marrying some 500 words of which scarcely one is wasted. Moreover a very high standard is achieved without neglecting explanation sacrificing clarity or omitting significant. Drugs are logically classified according to their therapeutic action and with the optimum of headings in various type settings rapid reference is greatly facilitated. Details of the types of preparations available including their trade names are given with their actions, dosages, dangers, contraindications, toxicity and side effects. Brief comments of relevant physiology, biochemistry and pharmacology are included only where essential to comprehension for the functions of the relevant textbooks are not usurped. A section of the Law and Drugs, a glossary of terms and abbreviations and a chart of paediatric doses are useful additions and the index sensibly lists drugs both by their approved names with trade names in brackets and vice versa.

Unlike most textbooks of therapeutics it is remarkably up to date and in drugs and execution it is admirably suited to its purpose of quick reference. The whole is enhanced with a brevity, lucidity and humorous whit, should be the envy and example of every would be author.

No ward should lack this excellent volume and every young doctor should have a copy ready to hand. Senior practitioners may feel it more dignified to keep their copies discreetly hidden.

T R W H

MAN'S ANATOMY, PHYSIOLOGY AND HEALTH. By Nancy Roper, SRN, RSCN, RNT. Third edition. Pp. ix + 509. Edinburgh and London: E. & S. Livingstone Ltd. Price 35s. + 3s. postage.

A comprehensive and well designed textbook which is of a different construction from any other I have come across. Written in the narrative style it packs a great deal of information into one small volume and remains readable and interesting throughout.

Miss Roper has produced a much needed book which links the structure and function of the body with the outside factors affecting health. Examination questions have been combined in this way since the introduction of the 1962 experimental syllabus for Nurse Training. Now the students may deal with the problem without reference to many different works.

Good reference books will still be necessary of course in any Nursing Library but I can recommend this as a general text book for Nursing Schools. C F C

MEASUREMENT IN MEDICINE. By P. D. Oldham. MA (Oxon) FSS. Pp. vii + 216. London: The English Universities Press Ltd. Price 50s.

Natural selection within science streams at school ensures that students destined for a medical career will as a rule be those with a good aptitude for mathematics. Thus most medical graduates have a fear of using statistical methods for analysing data. A number of good books exist to overcome this problem and most describe how the commoner statistical techniques can be applied to himself the result of an experiment. The approach of this book is different in that it aims to explain why certain techniques are chosen for particular problems and when pitfalls may lie in using them. Full understanding of the procedures described in the book requires a familiarity with statistical methods most likely to be acquired by scientists than clinicians and it is to them that this book will be of greatest value. D M A

YEAR BOOK OF NUCLEAR MEDICINE. Volume 3. 1968. Edited by J. L. Quinn III. Year Book Medical Publishers Inc. Chicago. Obtainable in UK from John Wiley and Son Ltd. Chichester. Pp. 427. Price 98s.

This book is the third on the subject of radioisotopes in diagnostic medicine published as part of the Year Book series. It consists of nonrase abstracts for significant scientific papers published in this field in 1967. The abstracts are conveniently collated under chapter headings covering the various aspects of Nuclear Medicine and serve not only as a useful summary over the whole subject for 1967 for those who do not take the relevant Journals, but also provide an introduction for deeper enquiry into particular aspects of this branch of medicine. A clear exposition of dynamic function studies is given as an introductory chapter. The book should be of interest to all those concerned in the application of these new techniques to the aid of improved diagnosis. D M A

BAILEY AND LOVE'S SHORT PRACTICE OF SURGERY. Edited by A. J. Harding Rains and W. Melvin Capper. 14th edition. Pp. xii + 1270. 1638 illustrations (266 coloured). London: H. K. Lewis & Co. Ltd. Price 84s.

This very popular book revised by A. J. Harding Rains and W. Melvin Capper is now in its 14th edition and 274th thousand and the present edition has an expanded page index intended primarily for the undergraduate it refunds nonetheless credit on the publishers that such a comprehensive and beautifully produced book at it costs only four guineas.

The fact that the previous edition was published as recently as 1965 indicates a serious attempt to keep the book up to date but it is a pity that it fails short of doing this in several places. For example although the deficiencies of the trifurcular Senguiaken tube are explained the better Blakemore Sengstaken tube is not mentioned and although hyperbaric oxygen is briefly mentioned as a treatment of gas gangrene more importance seems to be given to the administration of antigas gangrene serum which is now unobtainable as of little value.

Many new diagrams and photographs are included but unwarranted allocation of space is given at times, to subjects of little importance, and while three lines and a diagram are devoted to that old murderous instrument the boring little information is given concerning the correct management of hepatic necrosis. One would have hoped too that Pentagastrin would have been mentioned as the test of gastric acid output now replacing the augmented histamine test.

However the book remains a comprehensive textbook for the undergraduate and pre registration house surgeon for whom it cannot be bettered and if the postgraduate aiming at a higher surgical qualification must spend his invaluable reading time in the perusal of surgical journals and the abstracts that noncern him a multi volumn works this short pundit of surgery nontimes to provide a broad base upon which to build. C C

AN ATLAS OF CLINICAL NEUROLOGY. By J. D. Spillane. MD. FRCP. Pp. vii + 376. 477 illustrations. London: Oxford University Press. Price 70s.

This beautifully presented book is built round a collection of illustrations gathered over 20 years. Each of these is accompanied by a brief synopsis of the patient's condition or of the lesion illustrated.

This book is divided into thirteen chapters which deal not only with urological disorders but also diseases which are associated with the nervous system or which might be confused with neurological disease. One is constantly reminded that no speciality is an entity in itself and indeed there is an entire chapter on Endocrine Disease.

This Atlas allows people who are away from the constant presence of neurology to refresh their memory and to revise those concepts of observation but it comes into its own when used as the original collection of photographs were intended as an aid to teaching when it is required to illustrate or enlarge upon a certain point.

Dr Spillane writes in his preface It has often been said that a man can only write the book that is within him This is a renowned teacher's book J.F.R.

MANUAL OF DENTAL OPERATIVE TECHNIQUES By C. E. Chapman LDS HDD Pp 155 + index and 520 figures Edinburgh and London E. & S. Livingstone Ltd Price 25s + 1s postage

This manual contains the current teaching in operative dentistry at the School of Dental Surgery Edinburgh The notes, diagrams and illustrations have been prepared so that the student may have a single simple reference to the basic procedures used in Conservation Dentistry Theory is not discussed and alternatives are not even mentioned Because of this the teaching is entirely straightforward It is an ideal guide for the bewildered undergraduate

The presentation is attractive and the 520 diagrams are beautifully clear and explicit the notes are concise and easily read The diagrams form an excellent basis for explanations to assistants or discussions with colleagues

Those features which the undergraduate will find the very virtue of this book may irritate the more experienced operator Apart from the brief mention of rubber base impression materials bonded porcelain and in the section on Root Canal Therapy antibiotics the procedures are much the same as those we laboriously used as students

However one can thumb through this book in an hour and if one notices only a few methods to which one's standards have become less than perfect the hour will have been well spent.

One hopes that in time it will be possible to add equally well prepared sections on the use of the air turbine and the treatment of deciduous teeth R.L.T.

DENTAL PHOTOGRAPHY By C. P. Adams MDS FDS DOrth RCSEng FFDRCSI 78 pages 54 illustrations Bristol John Wright & Sons Ltd Price 38s.

This compact book is excellent reading for both novice and professional and the author has included many valuable hints for ultra photographers in Medicine Education and the Biological Sciences and a chapter on the reproduction of material for visual aid lectures theses and publications

The special problems of depth of field and illumination in clinical dental photography require more space in the text while the illustrations are so good that more in colour would be welcomed despite the expense

Among the diverse systems covered the Polaroid Land camera is not mentioned but the capabilities of the Box Brownie are surprising Criticisms of the ring flash require more elaboration for the beginner

The format and printing are of a very high standard and there is a bibliography and index. A.F.J.S.

News of the Service

OBITUARY

Surgeon Captain A. C. ANDERSON MB ChB died on January 3 1969 at the age of 81 years. He joined the Royal Naval Medical Service in September 1915 as a Surgeon Lieutenant. He was promoted to Surgeon Lieutenant Commander on September 1 1921 to Surgeon Commander on September 1 1927 and was placed on the Retired List on January 6 1943 with the rank of Surgeon Captain and reappointed to serve as Surgeon Commander. Surgeon Captain Anderson was released from the Navy on October 9 1946

HONOURS AND AWARDS

New Year Honours — 1969

Knight Commander of the Order of the British Empire
Surgeon Vice Admiral E. D. Caldwell CB QHP MD ChB FRCP(Edin), FRCP (Lond)

Commander of the Order of the British Empire
Surgeon Captain (D) J. D. Inverdale LDS

Member of the Royal Victorian Order (Fourth Class)
Surgeon Commander C. W. J. Ussher MRCS MRCP(Edin)

HIGHER QUALIFICATIONS

Surgeon Lieutenant L. G. Measey — DPM
Surgeon Lieutenant M. B. Matthews — DPM

PROMOTIONS

To Surgeon Rear-Admiral N. S. Hepburn CBE QHP (30.6.69)
R. P. Phillips OBE (29.9.69)
J. Watt MB FRCS (22.9.69)

To Surgeon Lieutenant Commander B. P. Gunton-Bunn MRCS LRCP

To Surgeon Lieutenant Commander (D) J. A. Ball LDS J. R. Kenny BDS M. R. G. Holmes, BDS LDS J. H. Gardner BDS LDS

To Surgeon Lieutenant A. B. Lonch MB FCH J. P. Beavis MB BS N. Irish A. Craig MB ChB W. D. McNicoll MRCS LRCP B. J. G. Soper MRCS LRCP, E. W. Tayler, MB BS W. D. Bisset MRCS LRCP K. C. Bouskill MB BS P. R. Vassell-Adams, MB BS LRCP P. J. Aggett, MRCS, LRCP S. B. Merrill MRCS LRCP

To Surgeon Lieutenant (D) J. M. A. Pickup BDS R. A. Pratt, BDS J. Pierson BDS P. S. J. Gelhaiby BDS J. Hargreaves BDS LDS

Provisional selections for promotion to date June 30, 1969

To Surgeon Captain J. S. Ritchie MB ChB DLO H. R. Mallows MD BCh DPH A. S. Falconer FRCS MRCOG

To Surgeon Captain (D) R. R. B. Gjertsen LDS.

To Surgeon Commander J. A. Cameron MB ChB DPM N. L. Denham MB ChB DA K. F. S. Lumley BM BCh DPH DIH R. R. Pearson MB BS I. MacG. MacIntyre MB ChB FFARCS F. R. Wilkes MBE MB ChB FRCS LRCP

To Surgeon Commander (D) B. Robinson LDS

NEW ENTRIES

Surgeon Lieutenant-Commander A N Bennett MB BS LRCP MRCS DCH
Surgeon Lieutenant D C Egerton MB ChB R D Curr MB BS LRCP MRCS AKC
Surgeon Sub Lieutenants J K C Cairns F Laverack G L Pryor T H Shaphurst N D A Thurstan D J Robinson R D Thompson R M Jones
Surgeon Sub Lieutenants (D) S L Humble G W Myers L G Iles, M H Morse T R King

TRANSFERRED TO PERMANENT LIST

Surgeon Lieutenant (D) K Pendrill LDS J V Holland BDS LDS

RELEASES

Surgeon Commanders M P Glanville MB BCh J F Ryan MB BCh D H Lovell MB BS DMRD
Surgeon Commander (D) E B C Cliff OBE FDS J D Stewart FDS RCS(Eng)
Surgeon Lieutenant Commanders J R Norman MB BS LRCP MRCS DCH K J Maclean MB ChB DFH R P Doherty MB BS MRCOG
Surgeon Lieutenant Commander (D) N J Stimson, LDS J C Ferrer BDS I M Barron BDS N R Attoe borough BDS
Surgeon Lieutenants C J Mount MB BS DObstRCOG M R Martin MB ChB Anita Roth MB BA M S Kearney MB ChB C G Ellis, MB ChB R Kingston MB ChB D T Munro MB BCh MRCS LRCP

WARDMASTERS

Retired Wardmaster Lieutenant T Montgomery MBE

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

HONOURS AND AWARDS

Officer of the Order of the British Empire
Miss M E Myers, RRC Principal Matron

Member of the Royal Red Cross (First Class)
Miss A M Gadd Principal Matron

PROMOTIONS

To Principal Matron Miss R Carter ARRC

NEW ENTRIES

Misses D A Chapman F E Wagstaff J C Saunders I R Grace F A Summerskin P D Tucker A M Fenlon L J Richards A F Gaughan C E Edwards B C Brown V E F Neary and J A Hanley

ROYAL NAVAL RESERVE

Queen's Honorary Dental Surgeon
Surgeon Captain (D) I G A Piper VRD FDS

Promotions

To Surgeon Captain V H Jones VRD
To Surgeon Captain (D) J H Farrell VRD MDS
To Surgeon Commander F Campbell and D Churchill-Davidson
To Surgeon Lieutenant Commander D F Bagent

APOLOGIES

Our apologies to Surgeon Captain G S Irvine for not noting that the illustration for his paper 'A Case of mixed Salivary Tumour of the Palate' (p 207 Winter 1968) was printed upside down

Page 272 Vol 54 No 3 Review *Fractures of the Facial Skeleton*

The last paragraph should read 'There is no doubt that this book will remain the definitive textbook on the subject of Maxillo Facial Injuries for many years It is recommended without reservation for use by consultants trainees and students'

Our apologies to the authors and to the reviewer for this omission

NOTICE

RN MEDICAL/DENTAL OFFICERS REDIRECTION OF MAIL

Owing to reduction of staff in the MINISTRY OF DEFENCE the redirection of mail can no longer be undertaken by the Department of the Medical Director General (Naval) Officers are therefore requested to make alternative arrangements for the redirection of their mail It would also be of help if firms supplying circulars could be either informed of your correct address or asked to delete your name from their mailing list

Notice

The Editor would like medical officers to send in original papers on professional subjects, travel, personal experience, etc. Items of news and matters of interest to the naval medical service will be welcomed from ships and establishments on home and foreign station. Notices of births, marriages and deaths are inserted free of charge to subscribers.

All articles or communications published in the JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE will become the property of the JOURNAL with full copyright powers unless the author declares when sending in the article that he desires to reserve the copyright to himself.

The Harvard system should be employed for bibliographical references, these references being arranged in alphabetical order of the author's name at the end of the contribution, thus: SMITH F. G. (1935) *J. roy. nav. med. Serv.* **22**, 53. In the text a reference to a publication should be cited by giving the author and in brackets the date, thus: Smith (1935) believed to be due, etc. or: lack of basic information on the strategic fundamentals of the science of the sea (Carlson, 1956).

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Articles and communications may be sent to the Editor at any time. **They should be clearly written or, preferably, typed and sent in triplicate** to the Editor, RN Hospital, Haslar, Gosport, Hants.

Subscriptions

For RN and RNR medical and dental personnel on the active or retired list and for Consultants to the Royal Navy the subscription is 20s. per annum (postage included) payable on January 1 of each year. Single copies 7s.

For all others who are *not* in the above categories the subscription is 24s. per annum (postage included) or 8s. per single copy.

Cheques and postal orders should be crossed Lloyds Bank Ltd. and made payable to the Editor, The Journal of the RN Medical Service.

The payment of subscriptions by banker's order is recommended as it relieves the subscriber of the necessity of forwarding a cheque each year and simplifies the keeping of accounts.

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MRS JOAN REYNOLDS

Editorial

SECOND SYMPOSIUM ON NAVAL MEDICINE

As mentioned in the Spring 1969 edition of the Journal the above Symposium will be held at the Royal College of Physicians London on the afternoon of Thursday 18th and all day Friday 19th September 1969

A brief outline of the programme is as follows

Thursday 18th September

1400 Opening Ceremony by Professor Sir Max Rosenheim Surgeon Vice-Admiral E B Bradbury and Admiral Sir Michael Le Fanu

1415-1700 Session I **SURGERY**—Chairman, Sir Cecil Wakeley

1715-1815 Preview of naval medical film 'Decompression Sickness'

1830-2000 Reception (Tickets 25s each)

Friday 19th September

1000-1230 Session II **MEDICINE**—Chairman Dr W W Brigden

1230-1400 Lunch

1400-1635 Session III **RESEARCH AND HYGIENE**—Chairman Professor R S F Schilling

A series of exhibitions will be presented throughout the Symposium covering a wide variety of naval medical subjects Independently the Harveian Librarian and the Librarian of the Royal College of Physicians will put on a library exhibit of *Medicine and the Navy*

Interval tea or coffee will be available on both days and a light lunch will be provided on 19th September without charge for ticket holders There will be bar facilities available on a cash basis

Programmes and tickets for the Reception and Lunch may be obtained from the Journal Office Royal Naval Hospital Haslar Gosport Hants Those who have already sent in provisional application need not apply again

NELSON

In a letter to the Editor Major General Richardson queries a suggestion in a former article that Nelson according to tradition and history said Kiss her for me Hardy rather than Kiss me Hardy Records however do show that on the first occasion after Nelson's comment when Hardy stooped to kiss his Captain, he expressed surprise and said "Who is that? This would have been an unusual reaction if the traditional interpretation of his words was true

TAX RELIEF

Subscribers are reminded that tax relief may be claimed on subscriptions under the terms of Section 16 of the Finance Act 1958

BACK NUMBERS

The Editors are continually being asked to supply to interested individuals and organisations old copies of the Journal They would be most grateful if any subscriber having unwanted back numbers could send these to the Journal Office Postage will be refunded There is a particular shortage of the following numbers Vol 32 (1946) No 1 Vol 39 (1953) No 1 Vol 48 (1962) No 1 Vol 49 (1963) Nos 1 and 2 Vol 51 (1965) No 1 Vol 54 (1968) No 2

Symposium on Modern Trends in Nervous Diseases and Gastro Intestinal Disorders

Held at the Royal Naval Hospital, Haslar on October 23 and 24, 1968

As stated in the Spring 1969 edition of the *Journal* the second day's Proceedings of the above Symposium with the edited lectures of all the participants are printed in this present edition

The lecturers were as follows

Professor C G Clark MD ChM FRCS(Eng and Edin) Professor of Surgery University of London and University College Hospital

Dr A M Dawson MD, FRCP Physician St Bartholomew's Hospital

Dr R A Kemp Harper MD FFR FRCP(Lond Edin and Glas) Director of Diagnostic Radiology Department St Bartholomew's Hospital, Consultant Radiologist to the Royal Navy

Dr J M Hinton, MB BCh MRCP Physician Chichester and Graylingwell Hospital Group

Dr F Avery Jones *CBE* MD FRCP Physician Central Middlesex Hospital Consultant Gastro Enterologist St Mark's Hospital and to the Royal Navy

Dr J E Lennard-Jones MD FRCP Physician University College Hospital Consultant Gastro-Enterologist St Mark's Hospital

Dr B C Morson MA DM FCPath Pathologist and Director of Research Department St Mark's Hospital Surgeon Commander RNR

Mr H R Thompson MA MB FRCS Surgeon St Mark's Hospital and Forest Hospital Honorary Consultant in Proctology to the Army

Unfortunately lack of space does not permit the publication of the tape recording of the panel discussions which followed the lectures

The next two day medical clinical symposium on Allergy and Rheumatic Diseases will take place at RN Hospital Haslar in March 1970 and not (regrettably) in October 1969 as was stated at the October 1968 symposium

DYSPHAGIA

By F Avary Jones

There have been a number of new techniques introduced in the past few years which have helped in diagnosis and clarified the mechanism of oesophageal and gastro-intestinal dysfunctions It is relatively recently only about fifteen years when radiologists began routinely to X ray patients lying down as well as standing and this produced at least a five-fold increase in the diagnosis of hiatus hernia with reflux and enabled many previously "X ray negative dyspepsias" to be interpreted and treated More recently there have been refinements in the methods of examination of the oesophagus particularly the use of anti-gravity swallowing techniques, the reduction of radiation with the use of television screens, and now the use of video tape recordings which enable barium examinations to be played back repeatedly The introduction of pressure motility recordings using small open ended tubes or balloons and the use of pharmacological techniques using strips of oesophageal muscle removed at surgical operations has enabled the basic dysfunction of achalasia and allied disorders to be defined Epidemiological studies have brought out remarkable differences in incidence of disease, particularly oesophageal carcinoma and this may point the way to aetiological clues Finally clinicians remain remarkably active in delineating new syndromes and working out the natural history of already recognised disorders A very interesting and valuable study is at present being conducted by Dr D A W Edwards on the clinical diagnosis of oesophageal disorders by carefully worked sequence of questions and he is finding that a constellation of answers to this algorithm can result in a clinical diagnosis which matches or even exceeds the score achieved by the radiologist[1]

Mucosal abnormalities and dysphagia

There is a group of patients, usually women who complain of food sticking in the throat and a barium swallow may sometimes reveal a web or stricture in the post cricoid region Anaemia is commonly seen in these patients usually iron deficiency anaemia but patients with pernicious anaemia have been reported where glossitis and koilonychia have also been associated Paterson, Kelly Plummer and Vincent are names associated with the description of this syndrome There has been a recent extensive population survey in Wales covering almost 5,000 people and some very interesting figures turned up The incidence of post-cricoid dysphagia was found to be 1 1 per cent in men and no less than 5 per cent in women and a web was shown radiologically in 15 4 per cent of the women with dysphagia but in none of the affected men A surprising further point was the demonstration that there was no marked difference between the haemoglobin level or serum iron in patients with dysphagia with or without a demonstrable web and controlled population casting doubt on the traditional association of sideropoenia and dysphagia (Elwood *et al* 1964)

There may be primary mucosal abnormality which affects the stomach as well as the pharynx and giving rise both to the achlorhydria which is commonly found and to the glossitis and mucosal changes in the pharynx. Anaemia may well be a result of the changes partly from impaired iron absorption and partly from diminished food intake. It is an important condition because undoubtedly it is a pre-cancerous state and post-cricoid carcinomas tend to appear after about 20 years with such dysphagia.

Globus Sensation (Globus Hystericus)

There is a group of patients who complain of feeling a lump or foreign body in the upper part of the neck behind the upper part of the sternum and who may say there is difficulty in swallowing. The key question is asking whether this difficulty is more obvious during meals or between meals and rather to the patients surprise they may admit that difficulty exists more between meals than with meals. The New England Journal of Medicine have a feature which they call Brief Recordings and in less than half a page and a commendably precise article Schatski (1964) provided the physiological explanation for this syndrome. Most of the patients are, for some reason, under tension usually of recent onset. A patient under tension may become more easily aware of parts of the body dysfunctioning and such patients may become aware of the act of swallowing of saliva and this may stimulate repeated acts of swallowing. This may reduce the amount of saliva and a peculiar sensation of a lump in the hypo-pharynx will result.

Obviously one has got to make quite certain there is no underlying physical disease and cases should be diagnosed without a barium swallow. The term *globus hystericus* is a thoroughly bad one and should not be used as it is so liable to be misinterpreted and resented by the patient. *Globus sensation* is a much better term for clinical usage.

OESOPHAGEAL RING STRICTURES ASSOCIATED WITH THE LOWER OESOPHAGUS LINED BY COLUMNAR GASTRIC TYPE EPITHELIUM

This is a condition in which the lower part of an otherwise normal looking oesophagus is lined by columnar epithelium similar to that normally found in the cardia of the stomach. This condition is probably embryologically determined. It is known that the oesophagus is entirely lined by columnar epithelium during the first five to six months of foetal life and squamous epithelium then grows upwards and downwards from the mid-oesophagus until all the columnar epithelium is replaced. It is reasonable to suppose that sometimes this process is incomplete. This abnormality with the lower oesophagus lined by columnar epithelium may have two important possible sequelae. First stricture formation tends to occur just above the junctional zone and this is due to oesophagitis with superficial erosion and underlying fibrosis which may extend into the sub-mucosa. Gradual increasing dysphagia may result but without any significant reflux symptoms. A simple dilatation is probably the treatment of choice for the mid oesophageal

stricture occurring at the junction of squamous and columnar epithelium with the patient learning to swallow gum elastic bougies The other important pathological change associated with the columnar epithelium in the lower oesophagus is the development of localised chronic penetrating ulcers resembling typical gastric ulcers Such ulcers known as Barrett's ulcers will occur only in this gastric type epithelium and never in normal oesophagus and lined by squamous epithelium A penetrating ulcer is of course particularly liable to be associated with pain but dysphagia is, of course a symptom and serious bleeding is particularly hazardous

Lower Oesophageal Ring Stricture

A variation of the condition already described may be found in the lower part of the oesophagus a few centimetres above the diaphragm This lower oesophageal ring or Schatski ring is a concentric smooth diaphragm like narrowing It is not associated with any localised oesophagitis although below the ring there is usually columnar type epithelium and above it squamous epithelium There are possibly two types of these ring constrictions one in which there is a structural web-like constriction and the other in which there is muscular contraction A follow up of these patients has shown that in most patients the ring remains constant in size although there is a tendency in some for the diameter to decrease slightly The clinical picture is a very typical one The patient describes episodes of bolus obstruction Most of the time he will eat perfectly normally but then a sudden episode of sub-sternal discomfort and dysphagia will follow the swallowing of a poorly masticated bolus of food usually bread or meat. Symptoms are sometimes very acute and although sometimes may be relieved quickly they may continue with retching for hours The patients naturally learn to chew their food well and eat slowly and avoid lumpy food These patients may have a demonstrable hiatus hernia associated with it but repair of the hernia and steps taken to reduce acid secretion is not enough and if operation is needed a direct attack on the mucosal diaphragm is necessary

Another type of stricture is the long stricture associated with peptic oesophagitis and usually with a sliding hiatus hernia. Considering the number of such hernias which exist in the population it is in fact, a relatively uncommon occurrence but may develop often quite unexpectedly and unpredictably in older age groups It seems that the defence mechanism of the oesophagus has suffered and allowed a localised area of peptic oesophagitis to develop leading not only to a spasm, but also to a fibrotic reaction of the sub mucosa Naturally in the older age groups this picture can closely simulate a carcinoma of the oesophagus and indeed the differential diagnosis can be quite difficult at times and a negative biopsy is not a complete protection against a diagnosis of oesophageal carcinoma Repeat X-rays and indeed repeat biopsies may be needed to establish the diagnosis accurately

Achalasia is the other important differential diagnosis particularly in the younger age groups although it can occur for the first time in later years of life Achalasia is a very interesting condition in which there is a motor disturbance of the oesophageal muscle Not only is there a failure of relaxation but there is a failure

of the normal coordinated activity which goes with a normal swallow and which may propel a bolus of food uphill There has been a considerable amount of excellent research work both on the motility derangement and on the basic pharmacological disturbances associated with this condition Essentially there is a reduction in the ganglion cells of the population and it seems that the most important features of achalasia are explained by the absence of post ganglionic fibres in the body of the oesophagus leading to faulty peristalsis and to the absence of adrenergic innervation at the lower end of the oesophagus leading to a failure of the muscle to relax with each swallow

It has been shown that there are α and β adrenergic receptors in both muscle layers of the sphincter The α receptors mediate contraction whilst the β receptors mediate relaxation The β adrenergic inhibitory innervation of both muscle layers of the cardiac sphincter is lost in achalasia (Misiewicz *et al* 1969) The basic cause of the loss of ganglion cells and the fibrosis with lymphocytic infiltration of the sphincter is still not yet known

DYSPHAGIA IN OLDER AGE GROUPS

Dysphagia in older age groups has special associations to be kept in mind Incomplete pictures of achalasia are not uncommon probably due to ageing processes with nerve degeneration An abnormally placed artery in relation to the oesophagus may begin to cause dysphagia when arteriosclerotic hardening has made it less flexible — a condition known as *dysphagia lusoria* Hiatus hernia in its more severe degrees is common in the elderly and in addition to peptic oesophagitis in some cases there may be torsion of large rolling hernias causing acute obstruction Obstruction from meat bolus is an occasional hazard particularly with deficient teeth Amyloid disease is easy to overlook and may cause dysphagia anorexia and weight loss

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Schatzki R (1964) *New Eng J Med* **270** 676

PEPTIC ULCERATION

By J. E. Lennard-Jones

To introduce the topic let me show you an X-ray of a lady of 36 who came up with a year's history of abdominal pain and some thirst (Fig. 1). The barium

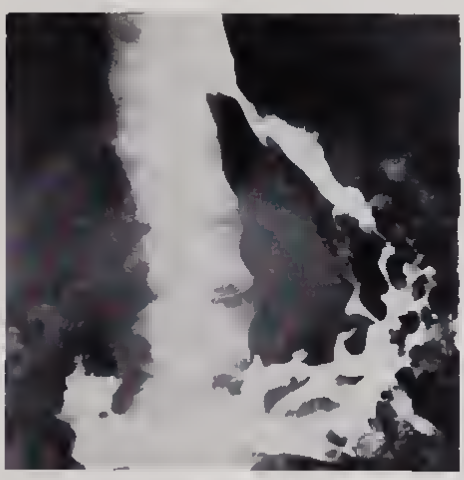


Figure 1. *Large gastric rugae and right renal calculi in a patient with Familial Multiple Endocrine Adenomatosis I (Wermer's syndrome).*

meal showed gigantic rugal folds in the stomach and a large staghorn calculus in her right kidney. These findings, of course, caused some excitement and she was admitted to a metabolic ward under Professor C. E. Dent for further investigation. She had only been there a short time when in the middle of one night she awoke with severe abdominal pain and at laparotomy she was found to have perforated an ulcer about two inches below her duodeno-jejunal flexure. I first saw her after this episode and on going into the matter rather more fully the interesting fact

emerged that her sister was at that very time being investigated in New Zealand for dyspepsia. Investigations showed that both sisters had extraordinary gastric hypersecretion and hyperparathyroidism. One patient eventually required a total gastrectomy and at operation she had a peptic ulcer in her oesophagus she had two in her duodenum, and she had another ulcer in her upper jejunum. Later her neck was explored and four chief cell adenomas of her parathyroids were found. We subsequently found that the patient's mother had had acromegaly–hyperparathyroidism, and a thyroid carcinoma and her brother had symptomless hyperparathyroidism. This Multiple Endocrine Adenoma Syndrome is rare but what about the ordinary peptic ulcer?

Site of Peptic Ulcer

There has been some quite interesting work recently on the site of peptic ulcer from which I think a concept has emerged. Peptic ulcer of the oesophagus the so-called Barrett ulcer tends to occur at the junctional zone between gastric mucosa and squamous mucosa. There has been some anatomical work on gastric ulcers, and it has been shown that these tend to occur just distal to the acid secreting mucosa in the pyloric gland area again a junctional zone. Duodenal ulcers are most common in the duodenal bulb again at a junctional zone between pyloric gland mucosa and duodenal mucosa. The surgeon makes another junctional zone when he does a partial gastrectomy and if a stomal ulcer occurs it does so just on the jejunal side of the anastomosis again illustrating that peptic ulcers tend to occur at a junctional zone and just distal to the acid secreting mucosa. Lastly the paediatrician sees another junctional zone when ectopic gastric mucosa occurs in a Meckel's diverticulum with an ulcer just distal to it.

Aetiology

The aetiology of peptic ulcer is still unknown. There are hereditary and constitutional factors particularly the sex of the patient his blood group whether he secretes the blood group substances in his saliva and body secretions and the number of parietal cells in the stomach. It is not possible to say whether excessive gastric secretion is hereditary or whether it develops later in life in response to unidentified factors. Patients with duodenal ulcer tend to be more often of blood group O than would be expected. It is just possible that blood group O is associated with a tendency to gastro intestinal bleeding rather than the ulcer and such an association would appear when you come to study a population of ulcer patients because many of those whose blood group is known tend to have bled. We might just mention also the tendency of gastric ulcers to occur in the lower income groups of the population the reason for this is completely unknown. Of environmental factors diet may be important tobacco is probably important, but I think that there are also other unidentified factors.

Incidence

There seems to have been a wave so to speak of peptic ulcers in the earlier years of this century. You may have noticed and taken courage from the fact,

that the incidence of duodenal ulcer in doctors is falling rapidly In fact the incidence as far as one can see according to Professor Morris's figures is about half in 1961/65 what it was in the years 1947/50 (Meade *et al* 1968) This fall in incidence is also shown in mortality statistics in the statistics for perforation and in the statistics for elective operation It would be fascinating to know what it was that caused a greatly increased incidence of duodenal ulcer in the first half of this century

Diagnosis

There are two problems in the diagnosis of gastric ulcer first to detect the ulcer and second to know whether it is benign or malignant I would like to remind you that you do not see a posterior wall gastric ulcer unless the patient is rotated so that the ulcer is seen in profile Therefore when you are looking at a barium meal always make sure that the stomach has been looked at from every aspect New instruments are now available for looking into the stomach The gastric camera is useful particularly for looking at the distal stomach and there are some good new fiberscopes which are very flexible and which have a moveable distal part Our ability to see the stomach and examine it without discomfort and without danger to the patient has thus increased greatly

The second problem with gastric ulcer is to know whether the ulcer which you see is benign or malignant Sometimes one sees very large ulcers particularly in older people and these tend more often to be benign than malignant A trial of medical treatment is not infallible but it is a fairly reliable way of differentiating between benign and malignant ulcers Other techniques for distinguishing between benign and malignant ulcers are cytology and biopsy I have no experience of biopsy but Dr Truelove and others in Oxford have been using a special fiberscope through which one can biopsy lesions in the stomach and obtain exfoliated cells from a selected area of mucosa (Gwyn Williams *et al* 1968) I do not know whether this is going to become a general technique or not, but certainly I think cytology is going to increase and in the United States a lot of reliance is placed upon it

There are three types of duodenal ulcer which are difficult to diagnose One is the duodenal ulcer in an undistorted cap secondly the very large duodenal ulcer and thirdly the postbulbar duodenal ulcer Acid secretory studies have a place in the diagnosis of duodenal ulcer If gastric secretion is low it makes a duodenal ulcer unlikely and conversely if you find that gastric secretion is above the normal range it makes the presence of duodenal ulcer probable but not certain for one can never diagnose that an ulcer is present from a gastric secretory study Gastric secretory studies thus have a place in the investigation of X-ray negative dyspepsia

TREATMENT

Over the last 10-15 years there have been a series of controlled trials of treatment in peptic ulcer but these have largely been confined to gastric ulcer This is for the simple reason that in gastric ulcer the ulcer projects from the lesser curve

and one can measure its area As soon as you can measure the size of an ulcer you can begin to measure the effect of treatment and this is just what Dr Doll and his colleagues have been doing Duodenal ulcers are very difficult if not impossible, to measure, and this has retarded progress in the study of treatment of duodenal ulcer so that we know much less about treatment of duodenal than of gastric ulcer The table summarises the trials that have been done and it also

TABLE 1

RECOGNISED FACTORS PROMOTING HEALING OF PEPTIC ULCER

	Gastric Ulcer	*Duodenal Ulcer*
Rest (Admission to Hospital)	+	?
Diet	0	0
Sedation	0	0
Stop smoking	+	?
Antacids	0	?
Anti-secretory Drugs	!	!
Anti peptic Drugs	?	?
Liquorice Derivatives	!	?
Oestrogen	0	+
Irradiation	0	+

emphasises how ignorant we still are about the treatment of this very common disease

As far as gastric ulcer is concerned admission to hospital appears to accelerate healing, diet has not been shown to be helpful nor sedation for every patient Stopping smoking has been shown to increase the rate of healing Antacids have not been shown to be helpful There is little knowledge about anti secretory drugs and little knowledge about the newer anti-peptic drugs Liquorice has been used as a treatment for peptic ulcer particularly on the Continent for many years and the original workers found that it did appear to heal gastric ulcers though it caused some fluid retention Attempts have been made to extract the active principles from liquorice, and one of the pure compounds prepared has been glycyrrhetinic acid of which Carbenoxolone is an ester Dr Doll and his colleagues in 1962 and 1965 showed that this drug increased the rate of healing of gastric ulcers in two trials

TABLE 2

LIQUORICE DERIVATIVES IN TREATMENT OF GASTRIC ULCER

		No of patients	*Ulcer Healed*	*Average reduction %*
1962	Carbenoxolone	30	11	72
(O P	inert tablet	20	1	35
1965	Carbenoxolone	24	10	78
(O P)	inert tablet	22	6	39
1965	Carbenoxolone	15	4	62
(J P)	inert tablet	16	5	72
1968	Deglycyrrhizinized liquorice	16		78
(O P)	inert tablet	17		34

(From Doll *et al* 1962 and 1965 Middleton *et al* 1965 Turpie *et al* 1968)

The ulcer healed on average by about 70 per cent in those given Carbenoxolone and only half as much in those given the inert tablet. In contrast Middleton and his colleagues (1965) showed that the rates of healing were approximately equal whether the patients were given Carbenoxolone or not, but in their trial the patients were admitted to hospital and put to bed, whereas the first two trials were conducted in ambulant patients. It looks therefore as though the main place of Carbenoxolone is to give you the same result in the patient who is up and about, as you would get if you put him to bed. Carbenoxolone may cause sodium retention with oedema, hypertension and hypokalaemia, and so it is a drug which must be used carefully and under supervision. Earlier this year Turpie and his colleagues (1968) reported a trial of another extract of liquorice, from which glycyrrhetinic acid had been excluded, and they obtained 78 per cent healing with this form of liquorice and 34 per cent with the control tablet very similar results to those obtained with Carbenoxolone. This is most interesting because this compound does not cause salt retention and yet it seems to be just as effective as Carbenoxolone. It is just possible that this is a treatment which could be given for long periods without harming the patient, for one of the problems in gastric ulcer is not only to heal the ulcer but to keep it healed.

Considering duodenal ulcer, we do not know whether rest brings about healing, there is no evidence at present that altering the patient's diet accelerates the rate of healing, regular treatment with phenobarbitone does not appear to be beneficial, we do not know the effect of stopping smoking, and most extraordinary of all, we do not know whether antacids alter the natural history of the disease. Despite much work we are still doubtful of the place of anti secretory drugs and we are doubtful of the place of liquorice derivatives. Two treatments do appear to help duodenal ulcer, but they tend to be unacceptable. One is the use of oestrogens and Dr Truelove (1960) has carried out a most elegant trial showing that Stilboestrol does increase the healing rate in men with duodenal ulcer. However side effects are frequent and Truelove was very careful to point out that this is an experimental approach. Irradiation of the stomach may be useful for cutting down gastric secretion in the very occasional patient with intractable symptoms for whom surgery is unwise.

Prognosis

Those of us who work in hospital tend inevitably to see the more severe type of ulcers. Recently there has been a very good follow up by a general practitioner, Dr Fry (1964), of all the peptic ulcers seen in his practice, and this is much more likely to be representative of peptic ulcers as a whole than those we see in hospital. His figures show that 9 per cent of gastric ulcers and 15 per cent of duodenal ulcers bled during a 5-15 year period. 2 per cent of gastric ulcers and 7 per cent of duodenal ulcers perforated, and that somewhere between 15 and 20 per cent of all patients with ulcer came to elective surgery during the same period. Figures of this type from an unselected group of patients give the most helpful perspective when giving advice about this disease.

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CERTAIN ASPECTS OF DUODENAL RADIOLOGY

By R. A. Kemp Harper

Summary

The diagnosis of duodenal ulcer may be relatively easy when there is a large ulcer and gross deformity of the first part of the duodenum. However, not all patients suffering from duodenal ulcer have such a lesion.

Pyloric spasm may have to be relieved by the intramuscular or intravenous injection of Probanthine or Buscopan before the stomach ejects sufficiently large boluses of barium to distend the duodenal cap. Small ulcers without appreciable deformity may only be seen when the duodenal cap is distended and the ulcer demonstrated in profile. Unless the cap is distended, a little barium between two mucosal folds may simulate an ulcer, whereas in distension the indentations tend to disappear (Fig. 1). The cap must therefore be shown in at least two views at



Figure 1. [illegible]

right angles when distended, and fluoroscopy and fluorographic films are also essential. The latter are best obtained with the patient in the right postero

anterior oblique position to right side raised when air from the stomach usually enters and distends the duodenum

When deformity is seen the ulcer if present is usually at the level of and opposite the incisura which in most cases is due to fibrosis thus the incisura usually points towards the site of the ulcer

Pseudo diverticula may simulate ulcers but the former vary much in size and have a mucosal lining

Duodenal ulcers are occasionally multiple and in such cases there is usually complex deformity of the duodenal cap with several pseudo-diverticula

Duodenal ulceration may occur high up in the cap or on the superior duodenal flexure so that the full sweep of the curve should be displayed otherwise superimposition of the two limbs of the duodenum may obscure the ulcer and the accompanying deformity

Ulceration may in certain instances spread to involve most of the duodenal cap and the size of the ulcer may suggest that one is looking at the filled duodenum The constant shape and size together with complete loss of mucosal pattern should indicate the presence of a so called giant ulcer There is also often to be seen a wide ring of translucency surrounding the ulcer due to the marked and extensive

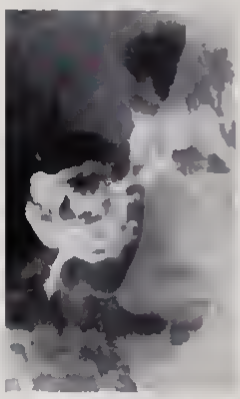


Figure 2. *Ulceration involving the [illegible] of the duodenal [illegible] for a normal duodenum but note the presence of oedema proximal and distal to the ulcer*

oedema surrounding the lesion associated with this may be a degree of stenosis proximal and distal to the ulcer (Fig 2)

Ulcers may also be seen in the second part of the duodenum and examination should never be considered complete without full examination of the duodenum and proximal jejunum Ulcers in the second part tend to cause marked symptoms considerable narrowing and often secondarily involve the pancreas as the ulcer usually tends to be in the posteromedial wall of the duodenum The presence of a crater and of thickened oedematous mucosal folds with narrowing of the lumen should help to make the diagnosis and here also the intramuscular injection of 30 mgm Probanthine can be useful in causing relaxation of any spasm so that the area may be better filled and also in order to obtain contrast films as for the demonstration of first part ulcers Differential diagnosis involves mainly the consideration of a carcinoma of the pancreas as this condition may spread into the duodenum and cause ulceration Usually however it causes enlargement of the head of the gland in addition to the duodenal changes when invasion takes place but the ulceration caused by pancreatic carcinoma is more extensive than the localised peptic ulcer Rarely the carcinoma may surround and invade the duodenum so that the differential diagnosis is from carcinoma of the duodenum In the latter

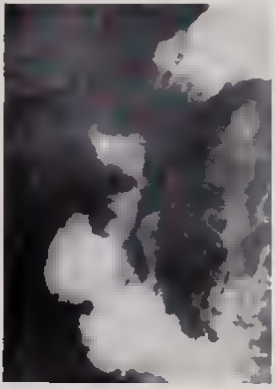


Figure 3 *Carcinoma of the duodenum at the Sphincter of Oddi patient died of jaundice and obstruction of the bile duct*

case there is usually no enlargement of the head of the pancreas and the narrowing and irregularity is more concentric (Fig 3)

Carcinoma of the pancreas may also invade the first part of the duodenum to simulate peptic ulcer but the secondary malignant ulcer is usually more irregular and there is a mass behind the duodenal cap so that it is more easily flattened than usual when compression is applied

Duodenitis without ulceration has to be differentiated from duodenal swelling and oedema secondary to pancreatitis With the latter there is enlargement of the head of the pancreas and some pressure deformity of the medial wall of the duodenum with a shelving effect and often flattening of the mucosa on this aspect In contrast to the lateral wall where the mucosal folds are much more prominent

Lastly, the relatively rare occurrence of primary carcinoma of the duodenum should not be forgotten as this lesion may be found anywhere from the junction of the first and second parts to the duodeno jejunal flexure Symptoms may be relatively mild yet with careful examination an obvious carcinoma may be found before obstruction leads to much more severe symptoms

Complete examination of the duodenum should be an essential part of every barium meal examination and which can lead to the diagnosis of lesions which are still operable

SURGERY OF PEPTIC ULCERATION

By Charles G. Clark

Operations for the treatment of peptic ulceration have changed considerably over the past decade Polya gastrectomy was the operation most commonly employed until it began to be appreciated that there was a significant incidence of late metabolic and nutritional complications As a result there was a return to the operation of vagotomy with a drainage procedure either gastro enterostomy or pyloroplasty Throughout this period of change there has been a tendency towards adopting a single operation to suit all circumstances For example at present there is more than one advocate for treating both gastric and duodenal ulcer by vagotomy and pyloroplasty This attitude may not be correct and it is conceivable that operations might be varied to suit the individual circumstance but such polit cies of 'tailoring the operation to size usually by relating the operation to the

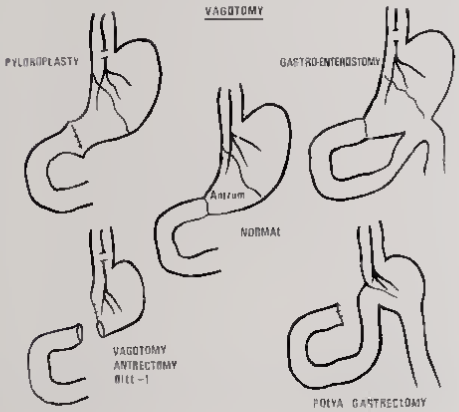


Figure 1 *The operative procedures used in the treatment of duodenal ulcer*

results of gastric secretion studies have not met with general acceptance The problem of treatment of gastric ulcer cannot be considered here Suffice to indicate that partial gastrectomy with gastroduodenal anastomosis (Billroth I) has proved satisfactory for many years apart from late nutritional complications Conservative surgery for gastric ulcer has only recently been introduced and time must elapse before it can be evaluated

The surgical treatment of chronic duodenal ulcer is based on methods of reducing acid secretion This can be done either by removing a large proportion of the acid secretory cells by resection of a major part of the stomach as in partial gastrectomy or alternatively it can be performed by interfering with the intrinsic mechanisms of secretion by carrying out vagotomy (Fig 1) Two major components of acid secretion are interrupted by vagotomy The neurogenic phase of secretion is obviously impaired but in addition the hormonal or gastrin phase is interrupted for both the elaboration of gastrin from the antrum and the ability of gastrin to stimulate the parietal cell are mediated by the vagus

The effect of these two operative procedures on acid secretion is quite different Partial gastrectomy reduces the ability of the stomach to secrete acid to a marked degree but at the expense of reducing the reservoir capacity of the stomach and interfering with other physiological functions such as the ability to produce alkaline mucus or the pyloric mill function of the antrum In addition the usual type of gastrectomy (Polya) joins the gastric remnant to the jejunum thus bypassing the duodenum and creating a pancreatico-bilial asynchrony which may be responsible for some of the untoward sequelae of operation such as the dumping syndrome or bilious vomiting Vagotomy on the other hand is less effective in reducing acid secretion but retains the other functions to some degree However the drainage procedure, for example gastro-enterostomy may itself impair some of these functions with the result that many of the complications of gastrectomy also occur after vagotomy and gastro enterostomy For this reason at the present time drainage of the stomach by pyloroplasty is regarded as the method of choice but as yet the long term results await analysis

Another approach to the treatment of chronic duodenal ulcer is in a sense a compromise between partial gastrectomy and vagotomy and gastric drainage This is the operation of vagotomy and antrectomy with a gastro-duodenal or Billroth I type of reconstruction The operation is directed against both components of the gastric secretory mechanism and is therefore on a sound physiological basis It limits the amount of stomach resected and thereby interferes less with gastric reservoir function

The merits of these various operative procedures can be compared in Table I which illustrates the results from a group of patients treated from 1958-64 During this time the criteria of selection for surgery did not alter but the operative procedure carried out was determined by a series of clinical trials This explains the disproportionate numbers in the groups and the fact that the average duration of follow up after vagotomy and pyloroplasty is less than for other procedures

About this time simple gastro-enterostomy was still being used to treat older patients admitted with established pyloric stenosis though this was soon abandoned. We can therefore compare the results of simple gastro-enterostomy partial gastrectomy vagotomy and gastro-enterostomy vagotomy and antrectomy and vagotomy and pyloroplasty.

The most striking finding is the close similarity between the results in the Excellent and Good categories between the patients treated by Partial Gastrectomy, Vagotomy and Gastro-enterostomy and Vagotomy and Pyloroplasty. These operations had a satisfactory outcome in 77-80.5 per cent of cases and it can be argued that this supports the case for an operative procedure with minimal surgical interference of the stomach. It is sometimes argued that vagotomy and drainage is followed by a high incidence of recurrent ulcer but it can be seen that this has not been the case, for the number of definite recurrent ulcers is greater after partial gastrectomy than with vagotomy. On the other hand the incidence of suspected recurrent ulceration is high in the vagotomy patients and further time must elapse for this to be fully evaluated.

The reasons for unsatisfactory results with the other operative procedures are of interest. The high incidence of recurrent ulcer after simple gastro enterostomy is well known and is evident in the results from the present series. The poor results after vagotomy and antrectomy are disappointing and are accounted for by patients with severe post operative disability from complications such as bilious vomiting and diarrhoea. It may well be however, that these results are biased because of the small number of patients and the relative lack of experience with this technique.

These results indicate that the change from partial gastrectomy to vagotomy and gastric drainage has not proved so disastrous as some had anticipated. On the other hand it could be argued that no very great benefit has resulted. This is because some of the benefits of the conservative operations are to some extent concealed. For example there is no doubt that by adopting a policy of conservative surgery for duodenal ulcer operative mortality is considerably reduced. Furthermore it is likely that the late nutritional and metabolic complications which occur after gastrectomy will be considerably less after conservative surgery. There remains the problem of why some patients develop recurrent ulcers after vagotomy, and why others should present with symptoms of alimentary dysfunction even though cured of ulcer symptoms. There is no doubt that the majority of patients with recurrent ulceration suffer from incomplete vagotomy. Paradoxically those patients with persistent alimentary dysfunction may be suffering from too liberal a vagotomy[1].

The major complication of vagotomy is so-called post vagotomy diarrhoea which has been attributed to denervation of the major part of the alimentary tract. There is no reason why vagotomy designed to interrupt gastric secretion should not be confined to dividing only those nerves going to the stomach. This should allow preservation of the branches of the vagus distributed to the biliary tract and also there are large coeliac branches derived from the posterior vagus which runs

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to the coeliac ganglion and is widely distributed to the pancreas small bowel and part of the colon Theoretically it is conceivable that interruption of these branches (Fig 2) might give rise to disordered alimentary function so that the operation of selective vagotomy has been attempted There is some argument as to whether or not selective vagotomy is technically more difficult to perform but the main interest is whether or not it abolishes post vagotomy diarrhoea That it does not do so is evident from a comparable series of patients treated by either selective or total vagotomy shown in Table 2 In all cases the vagotomy was shown to be complete and it can be concluded that whereas the incidence of severe diarrhoea was abolished by selective vagotomy, the complication still persisted in this group of patients.

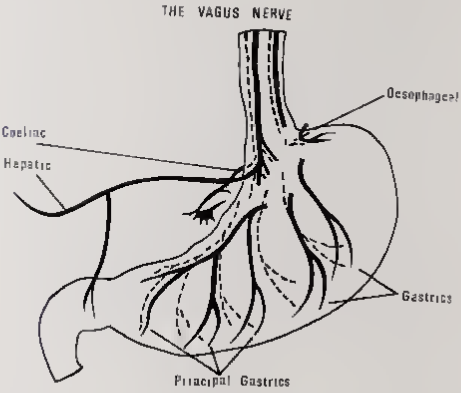


Figure 2 *The operative procedure in selective vagotomy*

CONCLUSIONS

There is no doubt that the treatment of chronic duodenal ulceration by surgery is a satisfactory procedure Some anxiety about the late results of partial gastrectomy has led to a radical alteration of the present treatment policy so that

vagotomy and gastric drainage preferably by pyloroplasty is the operation of choice The risk of recurrent ulceration is related to the technical expertise with which the vagotomy is performed The side effects of vagotomy may be diminished by the technique of selective vagotomy

TABLE 1

Results of different operations. The duration of follow up is 6 1–8 6 years for all groups except Vagotomy and Pyloroplasty where the follow up is 4 4 years.

	Gastro enterostomy		Partial Gastrectomy		Vagotomy Antrectomy		Vagotomy Gastro-enterostomy		Vagotomy Pyloroplasty	
	No	%	No	%	No	%	No	%	No	%
Total No	25		50		23		164		97	
Excellent	14	56	29	58	13	56 5	99	60	57	53 5
Good	4	16	10	20	4	17	34	20 5	23	23 5
	18	72	39	78	17	73 5	133	80 5	80	77
Poor	1	4	6	12	5	21 5	18	11	10	10
Definite recurrence	6	24	4	8	1	4	6	3 5	3	3
Suspected recurrence	—	—	1	2	—	—	7	4	3	3

TABLE 2

The results of a comparative trial of Selective and Total Vagotomy

SEVERITY OF DIARRHOEA FOLLOWING COMPLETE SURGICAL VAGOTONY				
	TOTAL		SELECTIVE	
	Cases	Per cent	Cases	Per cent
Patients* in group	42		40	
Mild	2	4 8	2	5 0
Moderate	8	19 1	6	15 0
Severe	4	9 6	0	0

*Patients reviewed at least 3 months postoperatively

MALABSORPTION

By Anthony Dawson

Our concept of the malabsorption syndrome has widened enormously in the last ten years with the introduction of such techniques as intestinal biopsy and the delineation of such biochemical defects as disaccharidase deficiency which may occur as an isolated phenomenon. Furthermore it is now realised that malabsorption of any nutrient may give rise to a nutritional defect in the absence of bowel symptoms and indeed steatorrhoea may not even be present, while some deficiencies such as protein may also be induced or aggravated by excessive loss from the bowel. Small bowel function should therefore be investigated in any patient with unexplained diarrhoea or a nutritional disturbance which is not solely accounted for by deficient dietary intake. One classification of the causes of malabsorption is given in Table I.

CLINICAL PRESENTATION

Either gastrointestinal or nutritional features may dominate the clinical presentation of patients with malabsorption.

Gastrointestinal

Diarrhoea — This is the commonest symptom. The stool may have no diagnostic features apart from being loose. Fatty stools are classically described as being pale, greasy, bulky, unformed and difficult to flush away. The offensive odour is due to bacterial degradation of unabsorbed fatty acids, carbohydrate and protein. Frothy acid and liquid stools result from the fermentation of unabsorbed carbohydrate. Severe exacerbations of any malabsorption state can cause watery diarrhoea. Some patients will deny that the stools are abnormal and may even be constipated, but careful questioning may reveal some of the characteristics of steatorrhoea.

Other Symptoms — Complaints of distension, bloating, flatulence, borborygmi, abdominal cramps and excessive bowel activity are frequent. Severe pain is unusual; its presence should suggest chronic pancreatitis, inflammatory bowel disease or mesenteric vascular insufficiency, although occasionally acute episodes of painful distension can accompany primary malabsorption states. Vomiting is rare except in children with coeliac disease.

Fever — This is an unusual symptom of coeliac disease but may occur in such conditions as parasitic infestation, inflammatory bowel disease, Whipple's disease and hypogammaglobulinaemia.

Nutritional

These are protean and are listed in Table II. The most common expressions are weight loss, anaemia, sore mouth, bone disease and oedema. A florid picture is uncommon but subclinical biochemical abnormalities occur frequently.

Weight loss This symptom is nearly always associated with anorexia, the patients rarely have a normal or increased appetite as suggested in textbooks. Weight loss is usually the result of this anorexia and is rarely solely due to malabsorption except in pancreatic insufficiency where gross steatorrhoea (over 40 g per day) may occur and represent significant loss of calories.

Anaemia — This is often a mixed picture with changes of iron deficiency and megaloblastic anaemia present. These patients may be diagnosed as pernicious anaemia and fail to respond to vitamin B_{12} therapy or they may present as megaloblastic anaemia not associated with achlorhydria. Unexplained megaloblastic or iron deficiency anaemia should call for investigation of the gastrointestinal tract.

Bone disease Bone pain, tenderness and deformity may occur without gross bowel symptoms and may be misdiagnosed as arthritis or rheumatism. This is often associated with proximal muscle weakness due to a proximal myopathy (Smith and Stern 1967). Pressure over the fingers may be painful.

PAST HISTORY

Childhood illnesses Subjects with adult coeliac disease may admit to having been an anaemic or sickly child who may have been unable to play games or suffered other disability.

Previous surgery Abdominal operations may have resulted in resection of specialised or extensive areas of small intestine or formation of blind-loops by bypasses and structures. Previous gastric surgery usually results in mild malabsorption which is often of no clinical significance although deficiencies of iron, calcium and vitamin B_{12} may develop. A *severe* malabsorption syndrome developing in a subject who has undergone gastric surgery in the past indicates the presence of a second lesion such as pancreatic insufficiency or a stagnant loop.

Residence in the Tropics Tropical sprue may first present many years after leaving an endemic area. Malabsorption first developing in the Tropics should suggest sprue or parasitic infestation. However, malabsorption syndromes usually associated with temperate climates can also occur in tropical areas.

Family history This is rarely of help except in some cases of coeliac disease and disaccharidase deficiency.

EXAMINATION

In many subjects physical signs are absent or minimal but when present may be divided into gastrointestinal and nutritional.

Patients with severe malabsorption appear grotesque. There is gross abdominal distension in which dilated loops of bowel may be seen through a thin abdominal wall. The percussion note may be hyperresonant due to gas or dull due to fluid in the loops of bowel. The face is thin resulting in a haggard anxious expression, and wasting of both muscle and fat in the limbs contrasts with the abdominal dis-

tension Mottled brown pigmentation especially of the forehead and temples may be seen and finger clubbing sometimes occurs Other nutritional features are given in Table II

The stool should always be inspected It may strongly suggest malabsorption A constipated stool in the presence of a nutritional defect does not exclude mal absorption but the presence of pus blood or mucus makes the diagnosis unlikely Oily material which solidifies on cooling suggests pancreatic steatorrhoea (Evans and Wollaeger 1966) Microscopy may reveal fat muscle fibres or parasites

INVESTIGATION

The purpose of the investigation is threefold

1 To demonstrate the presence of malabsorption
2 To evaluate the effect of malabsorption on the nutrition of the patient
3 To determine the cause

DEMONSTRATION OF MALABSORPTION

Specific tests of absorption (Dawson 1965a Textet *et al* 1964) often involve the collection of excreta which is unpleasant and subject to error They are often empirical since they involve ingestion of an abnormally large amount of a substance which is not a normal dietary constituent and which is given in the fasting state and not as part of a meal The commonly used tests are xylose tolerance lactose tolerance vitamin B_{12} absorption and faecal fat excretion

Xylose tolerance — After an oral dose of 25 g of D xylose more than 5 g should appear in the urine in 5 hours and the blood xylose level at 1½ hours should be more than 32 5 mg per 100 ml (Thayssen and Mullertz 1962) This test was introduced at a time when xylose was thought to be absorbed by diffusion, to be metabolically inert and to be excreted quantitatively in the urine by glomerular filtration without renal tubular reabsorption Although these assumptions have been proved incorrect the test has proved useful in clinical practice Xylose is relatively poorly absorbed from the jejunum and cannot be absorbed by the ileum (Fordtran *et al* 1962) In the normal subject there is little reserve capacity for absorption and so any condition which impairs absorption will soon be demonstrated For this reason a 25 g dose of the sugar should be used rather than a 5 g dose as larger doses will stress the bowel and reveal borderline cases of malabsorption (Joske and Haugeneau 1964 Rinaldo and Gluckmann 1964) Unfortunately falsely low values are often found and usually represent incomplete urine collection or vomiting but also occur in renal failure older subjects myxoedema skin diseases and after food or delayed gastric emptying In such patients it is therefore essential to estimate the blood xylose level during the test and this is proving more reliable than the urinary value Xylose absorption is a useful guide to jejunal function although it does not correlate with the degree of steatorrhoea or the serum carotene level (Christiansen *et al* 1959)

Glucose tolerance — Blood levels of glucose depend on many factors besides absorption and so this test is losing favour. However it is useful in pancreatic steatorrhoea because a diabetic curve is often found.

Disaccharide tolerance — Ingestion of 50 g disaccharide which is usually lactose or sucrose should result in a maximum rise of blood glucose of over 20 mg per 100 ml. In primary lactase deficiency a flat curve is found but the curve following ingestion of 25 g glucose and 25 g galactose is normal. Lactase deficiency secondary to mucosal damage may show impaired absorption of the monosaccharides. Unfortunately when venous blood is used 20 per cent of lactose tests have been found to be flat in normal subjects with normal intestinal lactase concentrations (McGill and Newcomer 1967). Disaccharidase deficiency can often be diagnosed by the production of symptoms such as abdominal pain, borborygmi and diarrhoea by the sugar load.

Vitamin B absorption — Malabsorption of the vitamin in the presence of intrinsic factor denotes an intestinal lesion (Adams and Cartwright 1963). Malabsorption which is corrected by the administration of antibiotics denotes an abnormal small intestinal flora. If antibiotics and intrinsic factor fail to correct the malabsorption a lesion of the ileum is probable.

Faecal fat — Pooled 3 day or 5-day samples of faeces have to be analysed as there is tremendous daily variation in fat excretion due to variable colonic emptying. Analysis of serial pooled samples may also show variation in disease and so a single analysis may be insufficient for accurate assessment. Normal values are less than 6 g per day of which approximately 2 g comes from endogenous sources. These values are not affected quantitatively or qualitatively by varying the dietary intake of fat in a normal bowel because of its large reserve capacity. When the reserve is compromised by disease or resection of the small intestine increasing the load of dietary fat can produce steatorrhoea. It is therefore important to place an adequate stress on the bowel and this may be done by substituting a 100 g fat diet and starting stool collections after a 48 hour equilibration period. Provided that the diet is completely eaten, tests may be repeated and the results compared so that progress can be assessed. Fat excretion using a standard ward diet is an adequate test if an abnormal value is obtained. However the fat content of such a diet may vary from 50–150 g per day depending on such factors as ingredients, cooking, appetite and personal tastes of the patients, so that variable results will be obtained in patients with borderline malabsorption.

Tests of pancreatic deficiency — evidence of pancreatic insufficiency may best be directly afforded by the Lundh test, when the duodenum is intubated and the duodenal trypsin level is measured after a standard liquid meal. In all patients in whom pancreatic deficiency is causing steatorrhoea the trypsin level is grossly reduced (Lundh 1962, Cook *et al.* 1967).

EVALUATION OF NUTRITIONAL DEFECT

(1) *Haematological* — Preliminary investigation will show an iron deficiency or a dimorphic anaemia. A blood film should be carefully scrutinised for macrocy-

tes and hypersegmented polymorphs The presence of Howell Jolly bodies is a clue to the presence of splenic atrophy associated with coeliac disease If malabsorption is now suspected serum B_{12} and folate should be estimated and a sternal marrow puncture performed Folate stores which are not necessarily reflected by the serum level have to be measured by urinary FIGLU or red cell folate levels

(2) *Metabolic bone disease* Low levels of serum calcium with normal or subnormal serum phosphorus values and a raised serum alkaline phosphatase indicates bone disease Confirmatory tests will be necessary

(3) *Serum albumin* — This measurement reflects the balance between breakdown and synthesis both of which may be abnormal

(4) *Prothrombin time* — This is rarely prolonged but should always be assessed prior to biopsy

DETERMINATION OF CAUSE

This depends on three different approaches

(1) The pattern of the abnormal absorption tests and deficiencies described above *eg* gross steatorrhoea with a normal haemoglobin and xylose tolerance suggests pancreatic insufficiency

(2) Radiography

(3) Small intestinal biopsy

Radiography

An adequate barium meal and follow through is essential Malabsorption due to structural lesions of the bowel such as diverticula Crohn's disease strictures and fistulae can be diagnosed Characteristic alterations in motility indicate scleroderma. Coarse gastric rugal folds suggest Menetrier's disease or Zollinger Ellison syndrome A 'malabsorption pattern may be demonstrated This includes intestinal hurry, flocculation and segmentation of barium dilatation of bowel loops thickening of the mucosal pattern and segmentation in a loop with a smooth mucosal pattern (Moulage sign) This appearance suggests malabsorption but does not diagnose the underlying pathology A mild malabsorption pattern may occur in 'functional bowel disorders' Conversely malabsorption can occur without any radiological signs, especially if the gastrointestinal symptoms are minimal A barium enema may be needed to demonstrate Crohn's disease or a colonic fistula

Small intestinal biopsy

Biopsy has revolutionised the concept of small intestinal disease by producing fresh tissue for microscopy, culture and biochemical analysis Complications are rare in adults but nevertheless it is desirable to perform the procedure in hospital where the patient can be observed afterwards Artefacts from incorrect orientation and sectioning of the specimen can lead to misdiagnosis The specimen should first be examined with a hand lens or preferably a dissecting microscope Normal villi are shaped like fungars tongues or narrow leaves but contrary to popular opinion finger-shaped forms rarely predominate in the upper jejunum Histological examination, besides assessing the shape of the villi, reveals abnormalities

in the epithelial cells and infiltration of the lamina propria. Although the small intestine can only respond to injurious stimuli in a limited way certain appearances are quite specific and Whipple's disease intestinal lymphangiectasia a-beta-lipoproteinaemia amyloid lymphoma and the nodular form of hypogammaglobulinaemia can be diagnosed. Giardia lamblia and certain worms may also be found in the specimen. Since the distribution of some lesions is not uniform a negative biopsy does not exclude the diagnosis. Biopsy is mandatory in all cases of obscure nutritional deficiency even in the absence of steatorrhoea.

CLINICAL SYNDROMES

Pancreatic insufficiency

Steatorrhoea is often gross and the diagnosis may be suggested by the presence of abdominal pain and diabetes. Provided that the underlying cause is not debilitating patients retain their appetite so that weight loss may not occur. Anaemia osteomalacia and a bleeding tendency are relatively uncommon. Xylose absorption and jejunal biopsy are usually normal. Glucose tolerance may show a diabetic curve. Calcification may be seen on abdominal radiographs. The diagnosis may be proved by a Lundh test.

Treatment is by a low fat high protein diet. Pancreatic extracts may be unpleasant to take and large quantities are required to fully replace normal pancreatic secretion. At the moment there is little information on the intraluminal concentrations attained after oral therapy and the small doses often prescribed may be without effect.

Liver disease

Obstructive jaundice causes malabsorption (Atkinson *et al* 1956) in which the fat-soluble vitamins and cholesterol are affected more than triglyceride. Anicteric liver disease may present as diarrhoea and steatorrhoea with minor changes in jejunal histology and otherwise normal small bowel function (Summerskill & Moertel 1962). Infective hepatitis is associated with an inflammatory lesion of the jejunal mucosa which may play a part in the production of steatorrhoea and diarrhoea.

Gastric surgery

Steatorrhoea may occur after any form of gastric resection and may follow vagotomy and pyloroplasty or gastro-enterostomy. Many factors are involved. For instance gastric storage capacity may be reduced. Resection of the pylorus results in faulty homogenisation of food. By pass of the duodenum results in inadequate mixing of chyme with the bile and pancreatic enzymes and loss of the main area for control of the osmolarity of the oncoming chyme. The main nutritional disturbances are weight loss anaemia and bone disease which are more frequent in operations which by-pass the duodenum but may occur after any procedure.

Steatorrhoea is usually the result of poor co-ordination of gastric emptying

and secretion of bile and lipase. Moreover, lower concentrations of bile and lipase may be secreted after vagotomy (Fields & Duthie 1965) and so there is impaired dispersion of fat in the bowel lumen. Occasionally severe steatorrhoea is due to an abnormal bacterial flora in the afferent loop and improves with antibiotic therapy.

Weight loss is usually the result of anorexia (Johnson *et al.* 1958) and does not result from loss of calories in the stools. Similarly folate deficiency is a combination of poor appetite and inadequate dietary intake and is not due to folate malabsorption.

Anaemia has been found in more than 50 per cent of patients with a partial gastrectomy (Hines *et al.* 1967) but can follow other operations. The commonest cause is iron deficiency which results from malabsorption of organic (food) iron although absorption of inorganic iron is not impaired. Several factors are responsible and include hypochlorhydria and diminished pepsin activity. The anaemia responds to oral iron therapy and ascorbic acid may be added as it improves iron absorption in these cases. Megaloblastic anaemia is usually due to vitamin B_{12} deficiency and may be masked by iron deficiency. It is nearly always due to impaired secretion of intrinsic factor but occasionally may result from an associated stagnant loop of bowel. Anaemia will not appear until the vitamin B_{12} stores have been exhausted which usually takes from 3–8 years. Although folate deficiency as judged by serum levels is common it is rarely responsible for anaemia.

Metabolic bone disease includes both osteoporosis and osteomalacia (Deller *et al.* 1964) and is commoner in women. Its incidence varies considerably in different countries which may reflect difficulties in diagnosing biochemical disorders (Bordier *et al.* 1968). Radiographs of bone are often normal in the presence of disease; serum alkaline phosphatase may be normal or raised; levels may indicate liver dysfunction or localised bone disease. Similarly serum calcium levels may be normal and low levels may only reflect hypoalbuminaemia. The diagnosis should be suspected in any patient with pains in the bones, rheumatism or arthritis and may have to be confirmed by bone biopsy or a calcium infusion test. Its aetiology is uncertain; it is not related to the degree of steatorrhoea and although calcium absorption may be impaired in some cases, vitamin D malabsorption appears more important in others. Treatment is by calcium and vitamin D. Anabolic steroids are not of proven value.

Gross clinical features of malabsorption are uncommon after gastric surgery (Neale *et al.* 1967) and should suggest the presence of a second lesion such as a stagnant loop, pancreatic insufficiency or previously compensated coeliac disease.

Resection of small intestine

Massive resection implies removal of at least 66 per cent of the small intestine. The clinical effects are variable and depend as much on the site as on the extent of the resection (Ingelfinger 1967). Although absorption of most substances takes place in the jejunum, the specialised pathways involved are also present in the ileum and so this region can compensate for jejunal excision. However, the com-

verse isn't true since the absorption of vitamin B_{12} and reabsorption of bile salts is exclusively an ileal function

Bile salt malabsorption results in interruption of their enterohepatic circulation (Hoffman 1967) and reduces their intraluminal concentration in the upper small intestine so that fatty dispersion of fat occurs with resultant malabsorption (Dawson 1967) Resection of the ileo-caecal valve also affects the outcome this may be due to loss of a barrier preventing the colonic flora from gaining access to the small bowel The condition of the remaining small intestine and ancillary organs obviously determine the degree of resulting malabsorption

Treatment of massive resection including the ileum is by a low fat diet Adequate calorie intake is provided by a high carbohydrate and high protein diet which is best taken in frequent small meals and occasionally by supplements of medium chain triglycerides This regime will decrease diarrhoea and steatorrhoea and diminish the faecal losses of calcium magnesium and potassium which may be gross Bile salt therapy with commercial preparations is usually valueless due partly to irritant impurities and multivitamin therapy is not required However vitamin B_{12} should always be given and vitamin D may be necessary The excision of a short segment of bowel which is then reversed and replaced to impede peristaltic progression may be beneficial but can lead to intestinal obstruction The construction of recirculating loops of bowel may allow more time for absorption but are not entirely satisfactory and more ingenious procedures have led to a high rate of complications in animal experiments

Coeliac disease

This is the commonest form of generalised malabsorption in temperate climates It occurs in children and adults but may present for the first time in the elderly (Collins 1966) The condition is caused by a toxic peptide present in the gliadin fraction of the wheat protein gluten but the mechanism of its action is unknown (Knowlessar 1967) It is diagnosed by jejunal biopsy together with a favourable response to a gluten free diet

Clinical manifestations are legion (Cooke *et al* 1963) and involve all the gastrointestinal and nutritional features mentioned before (Table II) symptoms are often not florid and may be absent It is not known why patients whose dietary intake and biopsy appearances are identical should vary so much in their clinical picture Most patients present with only a few of the listed features of which anaemia is the commonest This is usually due to a mixture of iron and folate deficiency but some degree of vitamin B deficiency is present in 30 per cent Disturbances of calcium and bone metabolism are common and osteomalacia can occur in the absence of steatorrhoea it may be refractory to therapy with vitamin D until gluten has also been withdrawn (Nassim *et al* 1959) A variety of skin changes are common and may respond to a gluten free diet Rare complications include the development of alimentary carcinomata and lymphomata (Harris *et al* 1967) various neurological syndromes (Cooke & Smith 1966) and intestinal ulceration leading to perforation or stricture (Bayless *et al* 1967)

Jejunal biopsy is essential to make the diagnosis Macroscopically the villi may show varying degrees of damage in which stunting broadening and fusion proceed to formation of ridges and convolutions which finally disappear altogether to leave a flat mucosa Histological examination shows abnormal villous architecture damage to epithelial cells and their microvilli and varying degrees of inflammatory cell infiltration of the lamina propria These changes are not specific to coeliac disease and occur in tropical sprue and in some cases of ulcerative colitis skin disease and carcinoma The mucosal damage is always greatest in the upper small bowel and decreases towards the ileum Extensive lesions always result in gross forms of malabsorption due to loss of ileal reserve (Stewart *et al* 1967)

Treatment is by gluten withdrawal or administration of nutritional supplements The former is preferable as it should improve the absorptive function of the bowel so that deficiencies can be corrected and prevented by absorption from the diet There is also suggestive evidence that malignancy is less likely to occur on a gluten-free diet but other complications have not been shown to be lessened Remission often starts within a few days although it may take up to one year for full benefit to be obtained Improvement occurs in appetite weight mental state and gastrointestinal symptoms, histological response is much slower 70–80 per cent of the patients respond to the diet (Pink and Creamer 1967) failure may occur for several reasons

(1) Failure to adhere to diet.
(2) Presence of a second disease — eg pancreatic insufficiency
(3) Complications of the disease— malignancy ulceration
(4) Jejunal atrophy is secondary to another lesion and not due to coeliac disease

Exclusion of milk from the diet, broad spectrum antibiotics (French 1961) or steroids may help certain refractory cases although steroid therapy has a high rate of complications

The alternative method of treatment is by the administration of nutritional supplements which are usually combined with a low fat diet. Iron and folic acid are needed most frequently If this form of therapy is employed the patient's clinical and biochemical state should be regularly reassessed since absorption remains impaired so that the deficiencies may be refractory to treatment or other nutritional deficits may appear

Tropical sprue

The aetiology of this condition is unknown It is now being seen more frequently in temperate climates in patients who have come from endemic areas Some will complain of residual symptoms following a more acute attack in the Tropics whereas others will have developed symptoms for the first time after leaving the area The latent period before development of symptoms after moving to a temperate climate may be very long and intervals of up to 15 years have been recorded

Acute sprue in the Tropics presents with gastrointestinal symptoms aggravated by food. Diarrhoea is common but in only one-third of cases are the stools frothy or fatty. Other features of the acute stage are anorexia, weight loss, glossitis, epigastric discomfort, distension, flatulence and heartburn. Nausea, vomiting, oedema and mental disturbances occur less frequently. Anaemia is present early. This stage progresses to a subacute one in which nutritional deficiencies become more prominent.

Chronic sprue is the final stage of the disease's process and is the form seen in temperate regions. It presents as a megaloblastic anaemia which is often due to vitamin B_{12} deficiency. Abdominal symptoms are variable and need not dominate the picture. Thus a subject may complain only of slight diarrhoea and abdominal distension.

The main problem is to separate the condition from coeliac disease (Klipstein, 1964). The duration of symptoms is shorter; they have often been present for less than six months when the patient first seeks medical advice. The abnormalities found in radiography and jejunal biopsy are similar in both diseases but less severe in sprue; for instance, a convoluted mucosa is common whereas a flat mucosa is rare. Sprue involves the entire length of the small intestine and this is reflected by vitamin B_{12} malabsorption in all cases and serum B_{12} levels are subnormal. Anaemia is therefore due to both vitamin B_{12} and folate deficiency. Subnormal values of serum iron, calcium and albumin are less common than in coeliac disease.

In acute sprue there is no response to a gluten-free diet but treatment with antibiotics, folic acid and vitamin B_{12} produce great initial improvement. Long term prognosis is less good and many patients have to be managed on a low fat, high-protein diet with vitamin supplements, especially folic acid and vitamin B_{12}. However, antibiotic therapy may produce gratifying results even in chronic sprue.

Whipple's disease

This is a rare disorder predominantly affecting middle-aged men. The condition should be suspected if malabsorption is associated with arthralgia; other features include fever, pigmentation, abdominal pain, polyserositis and peripheral lymphadenopathy. Diagnosis is by jejunal biopsy. The disease appears to be due to a low-grade bacterial infection and malabsorption follows infiltration of the lamina propria with macrophages and lymphatic obstruction. Treatment is by a prolonged course of broad-spectrum antibiotics and is curative.

Crohn's disease

This condition is usually regarded as a cause of abdominal pain and a palpable mass. However, nutritional disturbances are common (Dawson, 1969) and are often aggravated by anorexia. The disease may occur in any region of the gastrointestinal tract but is seen most frequently in the distal ileum and colon, and resection of this region is common. Vitamin B_{12} malabsorption is therefore frequent and evidence of bile salt malabsorption is accumulating. Jejunitis is

usually part of extensive bowel involvement and presents with a very different picture consisting of anaemia wasting steatorrhoea and protein-losing enteropathy Investigations reveal malabsorption of multiple substances Strictures and fistulae are common and may result in the superimposition of a stagnant loop on the clinical picture The hypoproteinaemia is frequently associated with a protein-losing state Intestinal resections produce more nutritional deficit than usual when there is disease in the remaining bowel

Anaemia may be due to blood loss and eventually to vitamin B_{12} deficiency but this only occurs after ileal resection or when there is a complicating stagnant loop syndrome Folate deficiency is common in the active stages of the disease but its relationship to anaemia is less clear

Stagnant loop syndrome

This term refers to the variety of circumstances in which an abnormal bacterial flora is present in the small bowel lumen (Table I) It may occur alone or aggravate malabsorption caused by another lesion The patients have diarrhoea steatorrhoea anaemia due to vitamin B deficiency (Tabaqchali & Booth 1967) and less frequently hypoalbuminaemia and deficiency of fat soluble vitamins This picture is superimposed on the characteristics of the underlying disease

The steatorrhoea is due to bacteria splitting normal conjugated bile salts to free bile acids which are less efficient in dispersing fat into micelles the form in which it is absorbed The free bile acids also cause diarrhoea due to direct irritation of the colon Bacteria also compete for vitamin B_{12} and render it unavailable for absorption They may also convert dietary protein into metabolites which are useless for protein synthesis and so induce protein deficiency

Radiography may demonstrate a structural lesion An abnormal bacterial flora can be cultured from jejunal aspirates but the technique is as yet in its experimental stage

Treatment is by surgical correction of the underlying lesion or the administration of antibiotics which may correct the malabsorptive state However vitamin B_{12} and other nutritional supplements will be required permanently if surgery is contraindicated

Disaccharidase deficiency

The main sources of dietary carbohydrate are the complex sugars starch and glycogen and the disaccharides sucrose and lactose Initial digestion of the two polysaccharides occurs in the lumen of the gastro-intestinal tract and the products are mainly the disaccharides maltose and isomaltose The final step in digestion of disaccharides takes place on the brush border of the intestinal mucosal cell (Crane 1966 Gray 1967) The main enzymes involved are maltase isomaltase, sucrase and lactase which split the appropriate disaccharides into monosaccharides which are then pumped into the mucosal cell by a specialised mechanism

Congenital deficiency — it is not surprising that children have been discovered who are lacking in one or other of the enzymes The main clinical conditions result from absence of lactase or a combined sucrase isomaltase deficiency These

children present in the neonatal period with acid diarrhoea failure to thrive dehydration and malnutrition. Treatment with a diet which excludes the offending disaccharide or its precursor improves growth and diminishes symptoms. In adult life such subjects can partly outgrow their symptoms although they are still unable to absorb the disaccharide. Occasionally sucrase-isomaltase deficiency is a cause of diarrhoea in adults.

Constitutional hypolactasia (acquired deficiency). Lactase deficiency in older children and adults is quite a different problem. The symptoms are variable and less severe. Diarrhoea abdominal colic borborygmi and distension may follow milk ingestion (Haemmerli *et al* 1965). Similar symptoms may be present in other subjects who are unable to relate them to milk. A further group may be asymptomatic and some may even be able to tolerate large amounts of milk. The severity of the symptoms depends on the amount of lactose in the diet and the variable response of the colon to the stimulus of the unabsorbed free sugar and its fermentation products. When a large lactose load is ingested there is a high concentration of unabsorbed sugar in the small intestinal lumen which attracts fluid by osmosis and so behaves like a bulk purgative sweeping water electrolytes and occasionally fat and protein down the intestine. Such an episode is uncommon on a normal diet since the concentration of lactose in milk is not high (40g per litre). In most subjects lactose forms only a small proportion of the dietary carbohydrate and only produces recurrent minor symptoms throughout the day which are probably the result of bacterial fermentation of lactose in the colon to produce short chain organic acids which irritate the large bowel.

Diagnosis is suggested by a flat lactose tolerance test (*vide supra*) which produces diarrhoea borborygmi and abdominal pain in 70 per cent. Absorption of glucose and galactose is normal. Other screening tests of absorption and nutrition are normal. Jejunal biopsy shows no anatomical abnormality and assay of the disaccharidase content of the specimen confirms the diagnosis.

Constitutional hypolactasia has now been found in many different parts of the world. There is a very high incidence (up to 90 per cent) in certain racial groups such as Negroes (Bayless & Rosenswaig 1966) and Greek Cypriots (Mc Michael *et al* 1966) although in Northern Europeans the incidence is probably about 10 per cent. In affected populations it would appear that there is a gradual regression of lactase activity as maturation proceeds, since there is a normal lactase concentration in the neonatal period (Cook 1967). This is comparable with most animal species and it can be argued that it is those who retain lactase activity that are abnormal.

The clinical significance of lactase deficiency has probably been overstressed in the past few years. It must be very rare for lactase deficiency to be the sole cause of severe diarrhoea as a presenting symptom. Moreover since hypolactasia is a common finding it should not be used as an explanation for other major symptoms such as marked weight loss or nutritional disturbance when another cause should be sought. Lactase deficiency has been described in association with a number of other diseases including ulcerative colitis, Crohn's disease, infective

hepatitis and febrile illnesses This association probably reflects the high incidence of the defect in any population However the symptoms of these diseases may be aggravated by dietary lactose or the development of the disease may render a previously compensated subject intolerant of milk

Secondary deficiency — when the intestinal mucosa is damaged by such conditions as coeliac disease tropical sprue and infections depression of the activity of all enzymes of the mucosal cell occurs in proportion to the severity of the damage The condition is reversible when the underlying disease heals It is not usually functionally significant in adults but in neonates and young children selective restriction of dietary sugars is often beneficial (Arthur *et al* 1966)

Protein-losing enteropathy (Dawson 1965b)

The hypoalbuminaemia in most malabsorption states is not only due to malabsorption of protein or deficient intake Studies with radioactive labels on albumin and other molecules of similar size have shown that there is often a concomitant increased rate of destruction due to leakage of albumin into the bowel lumen where it is degraded This is an exaggeration of the normal mechanism for albumin breakdown and under these circumstances the liver is unable to compensate by increasing albumin synthesis

This phenomenon of protein loss can occur in a pure form when it is analogous with the nephrotic syndrome or can be complicated by various forms of protein deficiency due to associated anorexia and malabsorption, so that wasting and skin changes may be more obvious as well as other signs of malnutrition For example in coeliac disease a degree of protein loss accompanies a generalised malabsorption defect, but peripheral oedema is not common although it may occur transiently during therapy Whereas in disturbances of the lymphatic circulation such as intestinal lymphangiectasia oedema predominates massive enteric protein loss results in hypoalbuminaemia upon which steatorrhoea and calcium malabsorption may be superimposed due to obstruction to fat transport in the intestinal lymphatics Thus in many patients the hypoalbuminaemia cannot be overcome by increased dietary protein

TREATMENT

Complete diagnosis of the cause of malabsorption should always be attempted in case specific therapy is available Careful screening for all possible nutritional defects is important so that precise replacement therapy may be given Blunderbuss therapy with vitamins is to be deplored General principles of treatment are laid out in Table III

Treatment of anorexia is often overlooked It is a major feature of many malabsorption states and patients need to be encouraged to eat as part of their treatment Moreover malnutrition should not be attributed solely to malabsorption in conditions where anorexia predominates Low residue diets for treatment of diarrhoea are potentially dangerous since they lack many essential nutrients such as folic acid and in the presence of malabsorption will aggravate deficiencies.

Medium-chain triglycerides are a recent useful addition to the therapy of fat malabsorption (Holt 1967) but their use is limited by expense. These fats are composed of fatty acids which contain only 8 to 12 carbon atoms and are therefore relatively more water-soluble. The intestinal mucosa has a greater capacity for their absorption than for the usual dietary triglycerides. Bile salts and chylomicron formation are unnecessary for absorption and hydrolysis is very rapid. The resulting fatty acids are transported by the portal vein instead of by the lymphatics. They provide a concentrated source of calories that is readily absorbed and therefore diminish the gastrointestinal and metabolic effects of steatorrhoea. They are clearly of benefit in any form of malabsorption but their use should be restricted to malabsorption states in children with growth retardation, adults where there is no specific therapy for the underlying disease, the short bowel syndrome and in lymphatic obstruction. They may also be added to a rigid low fat diet to make it more palatable since they can be used in cooking or salad dressing.

Patients should be seen regularly after diagnosis so that clinical and biochemical improvement can be monitored and any new deficiencies diagnosed and treated.

TABLE 1 CLASSIFICATION OF MALABSORPTION STATES

I *Disorders of Digestion*
- (1) Pancreatic Deficiency — cystic fibrosis, inflammation, carcinoma, etc.
- (2) Bile Salt Deficiency — liver disease, biliary disease, ileal resection.

II *Disorders of Absorption*
- (1) Loss of Absorptive Surface
  - (a) Surgical — resection, by-pass
  - (b) Mucosal damage — coeliac disease, tropical sprue, radiation, drugs, etc.
  - (c) Infection — Whipple's disease, enteritis, hepatitis, tuberculosis
  - (d) Inflammation — Crohn's disease.
  - (e) Infestation — hookworm, giardiasis, strongyloidiasis, etc.
  - †(f) Infiltration — amyloid, lymphoma
- (2) Stagnant loop syndrome
  Blind loops, strictures, fistulae, diverticula, scleroderma
- †(3) Lymphatic obstruction
- †(4) Vascular
  Mesenteric insufficiency, cardiac failure, constrictive pericarditis
- †(5) Endocrine
  Hypoparathyroidism, diabetes mellitus, Addison's disease, Zollinger-Ellison syndrome, thyrotoxicosis, carcinoid syndrome, systemic mastocytosis
- †(6) Miscellaneous
  - (a) Drugs — neomycin, PAS, phenindione, etc.
  - (b) Hypogammaglobulinaemia
  - (c) Pneumatosis cystoides
  - (d) Acrodermatitis enteropathica
  - (e) Allergic gastroenteropathy, etc.

III *Isolated Biochemical Abnormalities*
- (1) Disaccharidase deficiency
- †(2) Monosaccharide malabsorption
- †(3) Abetalipoproteinaemia
- †(4) Cystinuria
- †(5) Hartnup disease
- †(6) Pernicious anaemia

†Uncommon clinical causes of gastrointestinal disturbances due to malabsorption

TABLE II NUTRITIONAL DISTURBANCES FROM MALABSORPTION

Clinical Feature	*Deficiency*	*Comment*
WEIGHT LOSS	Calorie	Common Anorexia impaction
WEAKNESS	(a) Protein muscle wasting (b) Electrolyte — K Na Mg	Common
Short Stature	Multiple	Long-standing malabsorption
Amenorrhoea Infertility	Secondary hypopituitarism	Not uncommon
Oedema	Hypoproteinaemia	Rarely symptomatic
ANAEMIA	(a) Mixed — folic iron (Vit B_{12}) (b) Megaloblastic — folate, Vit B_{12} (c) Hypochromic — iron (d) Other — Vit B_6 ? Vit C	Common
Glossitis Cheilosis Stomatitis	Vit B Complex Vit B_{12} folic iron	Common
BONE DISEASE	Vit D calcium	Florid uncommon Biochemical common
Tetany Muscle cramps	Calcium magnesium and sodium	May be precipitated by blood transfusion or IV infusion
Bruising Bleeding Purpura	Vit K affecting prothrombin Factor VII Christmas and Stuart Factors	Rarely symptomatic
Skin	Vit B Complex Vit A Protein unknown factors	Common Protean types Rarely diagnostic
Neuropsychiatric *eg* peripheral neuropathy emotional depression etc	Vit B Complex Vit E Vit C Unkown factors	Common Rarely diagnostic

NB — Deficiencies of Vitamins A and C rarely manifest clinically

TABLE III TREATMENT

I *Primary Cause*	*Comment*
(1) Elimination Diets	May need ancillary therapy
eg — Gluten	
Milk	
Monosaccharide	Involves extensive carbohydrate restriction
(2) Curative Therapy	
eg — Broad spectrum Antibiotics	Stagnant loop Whipple's tropical sprue etc
Anthelmintics	
Excision of blind loop	
Removal of endocrine cause	

[illegible]	Replacement Therap	
	(3) — Pancreatic extr[illegible]	Preparation [illegible]
		Effect is unpr[illegible]dic
		Need large frequent [illegible]
	Bile salt prepar[illegible]	Barely feasible clinically

II *Correction of Malnutrition*

(1)	Calories	Combine with low fat diet
	High Carbohydrate	Calorie source
	High Protein	
	Medium Chain Triglycerides	Well absorbed use-calorie substitute
(2)	Specific Nutrients*	
	A Potassium	Oral doses variable 10-50 mEq daily
		IV slowly in emergencies
	B Calcium	12 16 G Gluconate daily
	C Vitamin D	Initial 100,000 U IM weekly
		Maintenance 100,000 U IM monthly
	D Magnesium	Urgent 3 6 ml 50% Mag Sulph
		IV or IM Can also use oral preparations
	E Iron	Various
	F Folic Acid	5 15 mg daily
	G Vitamin B$_{12}$	100 ng IM monthly
	H Vitamin K	Urgent 1 5 mg IM Phytomenadione
		Daily 5 20 mg oral Acetomenaphthone

III *Symptomatic*

Low fat diet (30 40 G)	Diminishes steatorrhoea and diarrhoea
	Reduces loss of Ca Mg etc
Cedilene Phosphate	60 240 mg daily
Prantanhine	45 135 mg daily
Kaolin Tinct Belladonna etc	

*Vitamins A C and B complex are normally supplied by a usual diet

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FUNCTIONAL DISORDERS OF THE COLON

By J. M. Hinton

Compared with other parts of the gut the colon is a relatively neglected organ. This is particularly so for its functional disorders. The work that I am about to describe is therefore of a very simple nature.

Before we discuss the abnormal we ought to consider the normal. The current concept of transport within the colon is in the main based on the observations of Sir Arthur Hurst and others screening opaque follow through meals in the first decade or so of this century. They observed on a few occasions mass movements of content from one part of the colon to the next and even at times along most of its length. These movements would occur over a period of only a few seconds. Whilst they occurred the normal haustral pattern would disappear to return at the end of the movement. Although to my knowledge it has never been formally proved mass movements are considered to be the main means whereby colonic contents are transported round the organ.

To these early investigators watching a screen for the majority of the time the colon appeared completely inert. In the 1930's A. E. Barclay did some interesting preliminary studies on localised movements using celluloid coated granules of barium sulphate and taking slow cine film with exposures at 7½ second intervals. He showed that there were local movements of the particles he thought probably in a circular fashion. Unfortunately he only made a few observations.

We have developed a technique which arises from Barclay's celluloid coated granules and W. C. Alvarez's coloured glass beads. We have made small radio-opaque pellets of barium impregnated polythene in two ways. First we punched them from sheets of the material giving us cylinders 3 mm. long and of varying diameters. Later we cut standard Portex radio-opaque tubing of various diameters into 3 mm. lengths. These pellets may then be followed through the colon on serial abdominal X-rays (Fig. 1) or the stools may be collected X-rayed and the markers counted (Fig. 2). In this way transit times can be estimated and movement in the colon studied.

I have used this technique for a few preliminary studies of movements in the colon. Firstly to study mass peristalsis a series of X-rays of markers in the colon have been taken at two hourly intervals. The markers are seen to be in roughly the same position for several films and then in the next one many are much further round the colon and a big movement has probably taken place though the point is not proven. Likewise taking pictures at quarter hourly intervals of a number of pellets in the ascending colon small movements of one pellet in relation to its neighbour can be seen to have taken place.

Thus there seem to be two sorts of movement in the colon: localised segmenting contractions which correspond to the rises of pressure recorded by radio telemetering pills and then a very small number of times a day the transporting movements of mass peristalsis.



Figure 1 *X-ray of [illegible]h — s, mark[illegible] in th[illegible]*



Fig[illegible] 2. X-ray [illegible] — s[illegible] wire marker

Now I would like to discuss some functional disorders. Table 1 shows the transit times, stool frequencies and stool weights for six patients with diarrhoea for which no other cause could be found. It has been shown (Connell *et al.* 1965) that normal stool frequency ranges from three times a week to three times a day. By this criterion only some of these patients have diarrhoea. Likewise taking 250 g per twenty-four hours as the upper limit of stool output only some have diarrhoea by this criterion. Transit times provide another means of gauging diarrhoea. Here the times taken to pass the first and 80 per cent of the markers have been measured. You can see that for the passage of the first markers some of the times are quite short. In fact all these patients had transit times which either for the first markers or for 80 per cent of the markers were below the normal range. This technique of measuring transit times provides another objective means of studying colon function. I say colon function because although the measurement is of total gut transit time, one knows from other studies that most of this time represents transit through the colon.

TABLE 1

TRANSIT TIMES

FUNCTIONAL DIARRHOEA

a.m. administration, times in hours

Subject	First markers		80% of markers		g stool per day	Freq.
	1st Study	2nd Study	1st Study	2nd Study		
C	3	1½	9	22	325	9
H	8	—	8	—	873	5
O	10	¾	25	25	141	2
Ro	14	5	8	72	356	3
Rn	15	—	15	—	308	4
U	6	5	22	24	211	3

Another type of diarrhoea' of which the patient may complain is frequency. One such patient complaining of 'diarrhoea' proved to have normal transit times, low normal stool weight but produced five to eight very small, mainly formed, stools each day associated with urgency. Here diarrhoea meant frequency. She had a very narrow rectum for which there did not seem to be any organic explanation. Here is another functional abnormality that needs further study.

A study of the transit times in normal male subjects has shown that when markers are given in the morning all subjects have passed their first markers by the end of the third day and 80 per cent of them by the end of the fifth day.

I have studied a group of thirty-seven patients presenting with constipation. These could be divided up into the groupings shown in Table 2. You will see

that about one third of the patients had transit times within the normal range. Amongst the sub-groups are one or two surprises. First there were three patients with the so-called Cathartic colon syndrome who have also been termed laxative addicts. These are patients who take so much laxative that their stools are always liquid. Two of these in fact, when taken off their laxatives, had normal transits but one was abnormally slow. There is one patient somewhat euphemistically labelled no unassisted bowel action. This patient despite very large quantities of laxative such as eighteen senokot tablets was quite unable to have a bowel action and had to have repeated enemas. Eventually it became clear that there was no alternative to ileo rectal anastomosis. No abnormality could be found in her colon by standard histological techniques.

TABLE 2

Constipation Clinical Groups

37 patients 8M 29F

Normal transit	11	— 7 intermittent laxatives — 2 daily laxatives with liquid stools — 2 spastic colon
Slow transit	23	— 18 infrequent bowel action — 1 no unassisted bowel action — 3 denied bowel action — 1 daily laxatives with liquid stools
Terminal Reservoir Syndrome	3	

When markers are followed along the colon of a patient with slow transit constipation it is found that the main site of slowing is the distal colon. In a typical sequence twenty-four hours after ingestion the most advanced markers have reached the mid transverse colon. Yet five days later they have only progressed further to the proximal sigmoid. We do not know whether this occurs because of a scaling down of mass peristalsis or whether this type of movement is abolished altogether.

There is a small but important group of constipated patients in whom the situation appears to be quite different. Here the markers travel round the colon at a normal rate but are then held up in a dilated rectum. This has been called the terminal reservoir syndrome (Bodian *et al* 1949). These patients may present with faecal impaction and spurious diarrhoea or incontinence. Such patients need to be distinguished from those with Hirschprung's disease by barium enema and rectal biopsy.

Another interesting group that appeared in this study were those that we have called Denied bowel action syndrome. These were all young girls who claimed not to be having bowel actions when by the marker technique we were able to prove conclusively that they were doing so. The first of these had been in various hospitals for some nine weeks apparently without bowel actions before we saw her and were able to prove that this was not the case by means of radio opaque markers and serial X-rays. All three of these girls were constipated and had transit times

above the normal upper limit They all also appeared to be psychiatrically disturbed

For routine clinical use this technique can be applied with a simple scheme to determine the transit times Twenty pellets are given before breakfast on day one and a plain film of abdomen is taken between 0900 and 1000 on day four and day six and if necessary on subsequent days If all twenty markers are still present on day four or less than sixteen are 80 per cent have been passed on day six then the transit rate is slower than normal

This division into normal transit or slow transit may be used as a means of dividing constipated patients into therapeutic groups Those with normal transit times have relatively mild constipation They need the reassurance of knowing that the transit time is normal They should be discouraged from using stimulant laxatives They may need assistance from bulking agents like Metamucil Isogel or Normacol or small doses of saline laxatives such as magnesium sulphate or sodium sulphate Those with slow transits are often considerably troubled by their constipation They need a laxative which will give them a soft but not liquid stool I don t think we know which is the best type of laxative for this long term use Personally I favour the saline laxatives as the ones least likely to do damage when administered over very long periods

Another value of this technique is that one can easily pick out patients who belong to the small groups like the denied bowel action syndrome and the terminal reservoir syndrome The former need psychiatric assessment and help and appropriate treatment for their slow transit constipation

Patients with the terminal reservoir syndrome probably also need a different approach The most important thing is to explain the situation both to the parents and to the patient One three subjects were all under fourteen The situation of faecal incontinence had produced considerable emotional disturbance both in the parents and the child Explanation to the parents that the child far from being difficult or lazy in fact had an abnormality in which he did not get an urge to defaecate and then offering a means of overcoming this problem can be of great help I think that rectal stimulation with suppositories coupled with a regular daily visit to the lavatory is the best approach temporarily oral laxatives may be required as well In one of these children once he had realised that he could get a regular bowel action by this technique he eventually found that he could manage even without a suppository This simple procedure revolutionised the life of what had previously been a rather unhappy family

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CONTROL OF INTESTINAL CANCER

By Basil Morson

Intestinal cancer is one of the common forms of malignant disease. It mostly affects the colon and rectum, being rare in the small intestine, for reasons which are quite unknown. The death rate in England and Wales is second only to lung cancer, with gastric cancer a close third.

The control and prevention of intestinal cancer as it has developed over the past quarter of a century can be considered under two main headings. Firstly, the treatment of established disease, mainly by surgery, which has led to a very significant cure rate as well as good palliative results. Secondly, the recognition and treatment of precancerous lesions has shown how intestinal cancer can be prevented or at least detected at an early and curable stage of its development.

TREATMENT OF ESTABLISHED DISEASE

Surgical Treatment

The overall curability rate for cancer of the rectum and colon in specialised centres in Britain and the United States when treated by surgical excision is about 50 per cent, even when the resectability rate is over 90 per cent (Bussey 1963). The cure rate is less in general hospitals but this is probably a reflection of a higher incidence of elderly patients with advanced disease. Surgical treatment as practised over the past quarter of a century can thus claim a considerable measure of control over death from intestinal cancer. To this must be added the success in the palliative treatment of advanced and incurable forms of the disease. Removal of the primary tumour undoubtedly delays death, for example by preventing intestinal obstruction, as well as relieving unpleasant symptoms. The development of restorative operations for cancer of the rectum has considerably reduced the proportion of patients who have to pay the price of permanent colostomy for a chance of cure. These achievements can be considered in the context of a high resectability rate as well as a low post-operative mortality rate.

The Dukes Classification was introduced at St Mark's Hospital in 1928 and is now accepted all over the world as a valuable guide to prognosis. The Dukes A case (15 per cent of all operated patients) is one in which the intestinal cancer has spread into the tissues of the bowel wall but not beyond, and there are no lymph node metastases. It is known today, after many years of follow up, that a patient with intestinal cancer at the Dukes A stage can be almost invariably cured of his disease by appropriate surgical treatment. A Dukes B case (35 per cent of all operated patients) is one in which the growth has spread into the peri-intestinal tissues, but there are no regional lymph node metastases. Such patients can be told that they have on the average about a 70 per cent chance of being cured of the disease. Once the lymph nodes are involved (Dukes C case) the prognosis

becomes p... only ab... one in three of the patients surviving five years. About 50 per cent of all operated cancers are in this stage.

The importance of early diagnosis of intestinal cancer is obvious from a study of the Dukes Classification. More patients would be cured by surgery if rectal cancer was diagnosed more frequently in the early (Dukes A) stage of the disease. It is a fact that there has been no significant change in the incidence of the different Dukes stages of intestinal cancer over the past twenty five years (Morson 1966) although the resectability rate has gone up from 46 per cent in 1930 to 92 per cent in 1960 (Bussey *et al* 1960). This suggests regrettably that intestinal cancer is not being diagnosed any earlier than it was 30 years ago.

Radiotherapy

If about half of all patients with intestinal cancer can be cured of their disease then it is necessary to enquire into the cause of death of those who failed to survive. Undoubtedly the majority succumb to death from metastatic deposits in the liver, lungs and other sites. About 10 per cent of all patients receiving surgical treatment for rectal cancer or 20 per cent of those who die of the disease develop local recurrence in the pelvis (Morson *et al* 1963). In colon cancer a significant minority, at least 10 per cent, die with local recurrence or peritoneal deposits. What more can be done to control the death rate among these patients most of whom have had surgical treatment at a relatively advanced stage of their disease? It would appear that surgery alone has little more to offer and this raises the problem of the role of radiotherapy and chemotherapy in the control of intestinal cancer.

It was not until the introduction of supervoltage radiotherapy that the reputation of intestinal cancer as radioresistant was modified. As a result attempts have been made to assess the role of radiotherapy as an adjuvant method of treatment. Pre-operative and post-operative treatment are being tried but so far with out any notable success (Tepper *et al* 1966). Meanwhile it is clear that radiotherapy may benefit individual patients. For example those with anaplastic inoperable rectal cancers can be made resectable by pre operative irradiation; some patients with low rectal cancers in whom local spread is extensive, should be given post operative radiotherapy to prevent pelvic recurrence. Moreover the palliative effect of irradiation for recurrent intestinal cancer in the pelvis or abdomen should not be underestimated.

PRECANCEROUS CONDITIONS

It is well recognised that the detection and treatment of precancerous conditions is an effective method of cancer control. The progress made in recent years in the screening of patients by biopsy and exfoliative cytology for precancer of the cervix is perhaps the best known example. In the intestine there are three precancerous states which require consideration. These are polyps, polyposis and ulcerative colitis.

Polyps

Precancerous [illegible] mostly presents in the form of discrete polyps. This word is purely a clinical term used to describe any tumour which projects from the surface of the intestinal mucous membrane whether sessile or pedunculated (Morson 1968). There are many different varieties of intestinal polyp which vary greatly in their clinical significance. It is only the neoplastic types of polyp such as adenoma, papillary adenoma and villous papilloma which are precancerous. Those that are the result of an inflammatory process and the hamartomatous polyps such as the juvenile and Peutz-Jeghers types probably have no malignant potential. The most common non-neoplastic type is the metaplastic polyp. This small sessile lesion is extremely common particularly in the rectum and is often confused with true adenomatous polyps to which it is unrelated. The detection and removal of the three morphological varieties of neoplastic polyp should lead to some degree of cancer control but it has not yet been possible to measure this.

Patients who have had partial removal of the intestine for colon or rectal cancer are at risk from the development of entirely new tumours in residual large bowel. It has been calculated (Bussey *et al* 1967) that at least 3·5 per cent of patients will develop a second primary growth on the average about eight years after the first operation. Moreover those patients who had adenomatous polyps as well as cancer in the first operation specimen stand more than twice the chance of developing a further primary tumour than when no polyps are initially present. All this means that patients who have had one cancer of the colon or rectum should be indefinitely observed in the follow-up period for evidence of disease in residual bowel. This applies especially to those who had adenomatous polyps as well as cancer in the first place. Here is an opportunity for cancer control in a definable group of patients.

Polyposis

Familial polyposis also known as polyposis coli and adenomatous polyposis is due to a dominant gene which may be passed by affected parents of either sex to their children (Veale 1962). Theoretically in accordance with Mendelian laws of inheritance when one parent only is affected half the number of children can be expected to develop this disease. In practice the manifestation or penetrance rate is only about 80 per cent so that the number of cases is slightly lower than expected. It is obvious that a detailed family history is the first essential in the control of a disease which inevitably leads to cancer if left untreated.

Although polyposis is a rare disease and accounts for only a very small proportion of the total deaths from intestinal cancer it provides an excellent opportunity for cancer control in a definable population of patients.

Polyposis patients can be divided into two groups. Firstly those who present with symptoms and these are mostly the first member or propositus of the family to be seen. Secondly those persons who are at risk from developing polyposis be

cause they are relatives of known polyposis patients These are known as call up relatives

The main effort is directed towards getting the relatives of polyposis patients investigated before they develop cancer The prevention of malignant disease has limited scope in those presenting with symptoms for two thirds of them already have cancer when first seen It is only when attention is turned to the families that cancer control gives greater practical importance (Dukes 1958) (Bussey and Morson 1967) Thus there is a dramatic decrease in the incidence of malignant disease among call up relatives (14 per cent) as compared with the group presenting with symptoms (67 per cent) This considerable success in cancer control in a definable population of patients with a precancerous condition should be further improved upon in the future provided that the relatives of polyposis patients are kept under close observation

Cancer in Ulcerative Colitis

Since the first reports of carcinoma of the large intestine occurring in patients with ulcerative colitis (Crohn and Rosenberg, 1925 Yeoman 1927 Bargen 1928) there have been many attempts to estimate the risk of malignant change There have been difficulties in defining the population of patients at risk because different hospitals study samples which are influenced by variations in methods of selection (Welch and Hedberg 1965) For example the incidence of carcinoma in ulcerative colitis in medically managed patients is lower than those treated surgically Despite these difficulties there would seem to be general agreement that the incidence lies between three and five per cent of all cases (Edwards and Truelove 1964) When comparing this figure with the incidence of cancer of the colon in patients with ulcerative colitis it is between five and ten times greater than persons without the disease (Goldgraber and Kirsner 1964) which is small in terms of the absolute number of cases affected

The next step has been to show how this increased risk varies with length of history and the clinical type of colitis Here again there is general agreement that the risk of malignant change begins when the patient has had symptoms for approximately ten years and particularly in those whose disease starts early in life It has been confirmed that patients with total colitis are most at risk from malignant change and that distal forms of the disease have an almost insignificant chance of developing carcinoma

Having defined the type of patient with ulcerative colitis most susceptible to malignant change the treatment of the individual remains a formidable problem Prophylactic proctocolectomy for all patients with total colitis and a history of symptoms exceeding ten years would certainly result in colectomies being performed for patients who were not going to develop carcinoma Moreover there is difficulty in persuading a patient who has spent many of the best years of his life getting adjusted to his colitis that a major operation with permanent ileostomy is necessary Moreover some patients developing carcinoma in colitis have few

symptoms and are in remarkably good general health Despite great progress in research we have still not defined the colitic most at risk from developing carcinoma in sufficiently precise terms applicable to the individual patient Rectal biopsy may be the test required (Morson and Pang 1967)

Precancer in ulcerative colitis can be recognised by microscopic examination of rectal biopsies It is suggested that all patients with total colitis and a history of symptoms for more than ten years should have a regular examination- at least once every six months when sigmoidoscopy and rectal biopsy would be performed Such a policy should help to detect those individuals with colitis who are in a precancerous phase These would require total proctocolectomy

Cancer Families

Although environmental factors must certainly be important in the aetiology of intestinal cancer no specific factors have yet been identified On the other hand there is some indication of a familial tendency in patients with precancerous polyps (Woolf *et al* 1955) and established cancer (Mathis 1962 Kluge 1964 Lynch and Krush 1967) which suggests that genetic factors may be involved Further research is required to define the familial factor more precisely but enough evidence already exists to indicate how a modest effort at cancer control might be instituted The family doctor as much as the hospital specialist is involved

The relatives of patients who have had intestinal cancer or precancerous polyps are the persons presumed to be more at risk than the general population They should be instructed to report any suspicious symptoms such as change in bowel habit abdominal pain or rectal bleeding Generally speaking this would be applied only to patients over forty years of age unless there is a particularly strong family history of intestinal cancer when the younger age groups should also be kept under observation It might be argued that this policy would create an unnecessary sense of anxiety among persons only a small minority of whom would ever suffer from the disease The only answer is that this is the price to be paid for cancer control in the present state of knowledge

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ANAL ULCERATION

By Henry R. Thompson

Anal ulceration may present from infancy as the condylomata of congenital syphilis to dotage as a squamous carcinoma. There are few diseases which cannot present as or be complicated by an anal ulcer. It is not the acute ulcers of the anus such as those that occur in paratyphoid fever or chicken pox but rather the chronic anal ulcer that I wish to discuss today.

The diagnosis of an anal ulcer is made by following a methodical series of investigations. At the first examination it is essential to measure the size and shape of the ulcer and its relationship to the anal margin and anal canal. The characteristics of its edge its floor and its base and the state of the surrounding tissues should be noted. The inguinal lymphatic glands should be carefully palpated and the tonus of the anal sphincter should be assessed. Cultures should be taken from the floor of the ulcer and serum or saline washings obtained for a dark ground illumination test for spirochetes. Examination of the rectum and lower colon should be made by proctoscopy and sigmoidoscopy. After endoscopic examination examination of the blood serum complement fixation tests and radiological examination of the chest and intestinal tract should be carried out. Biopsy should not be used as a shortcut to diagnosis. Biopsy may be made of the ulcer itself the mucosa of the rectum or the inguinal glands. Lastly, a therapeutic test may be of value when the diagnosis remains in doubt in spite of a full investigation. For instance when tuberculous or amoebic ulceration is suspected but cannot be proved in course of anti tuberculous or anti amoebic treatment may result in healing and it can be assumed that the ulcer was due to one of these causes.

The commonest ulcer is that of fissure in ano and the problem of the practitioner is to decide which fissure is likely to heal with medical treatment and which fissure will require surgical treatment. This can usually be determined by a careful examination of the floor and edges of the fissure. If longitudinal muscle fibres are seen in the floor of the fissure and its edges are not undermined the fissure will heal with simple conservative measures. If however whitish circular muscle fibres of the internal sphincter are seen in the floor of the fissure and the edges are undermined surgical treatment is required for a permanent cure.

I would like to emphasise how very similar a primary syphilitic ulcer is to an anal fissure. Before the war anal syphilis was seen in St Mark's out patient clinics once or twice a year. We now see this type of ulcer once or twice a month. The symptoms of both conditions may be essentially the same the patient complaining of soreness irritation and a little discharge. Very often a general appraisal of the patient while history taking may raise the suspicion that the patient is a homosexual. Suede shoes are a frequent but of course not an invariable indication of the patient's sexual habits. The ulcers of fissure in ano and syphilis are very similar but have definite differences. The syphilitic ulcer is usually a little larger than an anal fissure. Instead of being in the midline posteriorly (the commonest place

for anal fissure) it may be to one or other side of the midline Examination of the ulcer of anal syphilis does not give rise to acute pain as in fissure in ano and there is relatively little sphincteric spasm These minor differences should immediately arouse the clinician's suspicions and the inguinal glands should be examined This may reveal a typical bubo and examination of the patient's body may show typical syphilitic rashes Finally a dark ground illumination examination may demonstrate the spirochete

The importance of recognising the syphilitic lesion in a busy clinic cannot be overstressed because on its recognition obvious and immediate steps must be taken to prevent the transmission of the disease to another patient

One of the commonest bacillary ulcers of the anus is tuberculous ulceration and while syphilitic ulceration is becoming more common tuberculous ulceration is on the decrease A history or a family history of chronic pulmonary tuberculosis may be the first clue to the diagnosis and an examination of the chest is of paramount importance. As giant cells can be demonstrated in nearly all chronic lesions of the anus the interpretation of biopsy material in chronic lesions is by no means easy and there are diseases which have not only giant cells but epithelioid systems seen in microscopic sections Before accepting the diagnosis of tuberculous ulcer not only giant cells and epithelioid systems but caseation should be demonstrated in the microscopic slide and I personally am unwilling to accept the diagnosis of tuberculosis unless the tubercle bacillus can be seen in a slide stained by Ziehl Neelsen's method recovered by culture or demonstrated from lesions of an inoculated guinea pig

Twenty to thirty years ago there would be one or two patients each year seen in the St Mark's out patient clinics with anal ulceration in which investigations failed to establish any diagnosis We now recognise that these cases were probably Crohn's disease of the anal canal The increase in occurrence of this lesion is shown by the fact that last year at one time 15 per cent of the hospital beds were occupied by patients with Crohn's disease Crohn's disease has been known to affect the intestinal tract from the lips to the anus The anal disease may be seen in many diverse forms — as a chronic fistula in ano as a recto vaginal fistula in young women as a solitary ulcer or multiple ulcers or as the extreme condition of complete ulceration of the perineum and inguinal regions when it is difficult even to identify the anal canal itself Characteristic of Crohn's ulceration is oedema of the surrounding tissues This may be seen in the form of oedematous anal tags and in women of oedema extending into the labia The edges of the ulcers are irregular mauve coloured and invariably undermined This undermining gives rise to single or multiple thin epithelial skin bridges which are quite characteristic of the disease Another clinical feature is that in spite of extensive ulceration the patient denies any pain or discomfort and seems prepared to tolerate a state of affairs that might drive others to suicide Anal ulceration may be the only demonstrable lesion of Crohn's disease at the time of examination On the other hand it may be associated with Crohn's disease of the rectum colon or small intestine The disease however may not become manifest in other parts of the intestinal track

until months or even years later It is one of the commonest causes of the failure of treatment of a fistula in-ano although it is not unknown for a Crohn's fistula to heal with standard fistula treatment Not infrequently the treatment for this distressing condition may have to be an excision of the rectum with a colostomy or a proctocolectomy with ileostomy and although the disease is usually seen in young people it may occur in patients of 70 years of age

I have considered two forms of anal ulceration in which the patients complain of very little pain Now I would like to mention an ulcer probably caused by a virus which like fissure in ano is acutely and exquisitely painful — Behçet's ulcer This is a syndrome where ulcers of the anus and genitals are associated with ulcers of the lips mouth and tongue and with ophthalmic and neurological disease The anal ulcer may be single or multiple It is a very shallow erosive ulcer irregular in shape with bluish edges rather suggestive of a tuberculous ulcer Examination of the mouth, tongue and eyes may provide the evidence to make the diagnosis

Leucoplakia of the anus is characterised by the heaping up of the perianal skin and anal epithelium into whitish areas which occasionally spread up onto the columnar epithelium and cause ulceration In advanced cases normal defaecation is impossible and digital removal of faeces becomes necessary The diagnosis of this condition is as simple as the treatment is difficult Local excision with or without skin grafting is inevitably followed by recurrence

Malignant ulceration of the anus may occur in three ways

(1) A primary tumour of the anal canal or anal margin which is invariably one of the forms of squamous carcinoma
(2) The local spread of an adenocarcinoma from the rectum into the anus, and
(3) By implantation on a chronic granulomatous lesion of the anus (fissure or fistula) from a malignant tumour in the lower pelvic colon

Squamous carcinomas of the anus present a typical everted rolled edge Their bases are indurated and they are not infrequently associated with enlargement of the inguinal glands It is important to differentiate between squamous carcinomas at the anal margin which microscopically show well developed cell nests and keratinisation and those carcinomas that develop in the upper part of the anal canal known as basaloid carcinomas or transitional celled carcinomas The small well differentiated squamous carcinoma of low grade of malignancy at the anal margin may be successfully treated by a well conducted local excision or radiotherapy It tends to metastasise in the inguinal glands The basaloid carcinoma of the upper anal canal however metastasises in the glands of the mesorectum and these cases must be treated by a radical combined excision of the rectum Local surgery and radiotherapy are unlikely to be of any benefit.

Lastly there are three specific forms of malignant anal ulceration which must be mentioned First of all rodent ulcer can occur at the anus This is a tumour which grows from the basal cells of the epithelium which are arranged in palisades This tumour does not metastasise and can be well treated by local excision Paget's disease which is more familiarly seen at the breast nipple may

occur at the anus This is a chronic intradermal carcinoma where the malignant cells spread only in the epithelium and do not go through into the dermis Local excision is unsuccessful and is frequently followed by a recurrence Bowen s disease may result in ulceration of the anus and might be summed up as being a mixture of Paget s disease and rodent ulcer The disease is an invasive condition of the epithelium and the epithelium alone

The diagnosis of an anal ulcer can usually be established by a methodical general examination of the patient and the local lesion There are however rare forms of ulceration which need a knowledge of their existence before a diagnosis can be made This is common to all diagnostic problems

Once the diagnosis is made—and if the cause of the disease is understood treatment is relatively simple In those lesions where the aetiology of the disease is obscure however treatment is extremely difficult and may entail major surgery

Articles

TOMOGRAPHY OF THE FACIAL CANAL: AN EXPERIMENTAL STUDY

By John A. B. Harrison and E. H. Burrows

The course of the 7th cranial nerve in the facial canal cannot be visualised adequately on conventional radiographs because of the fine calibre of the canal and the density of the compact bone surrounding it. The course of the nerve can be visualised radiographically by means of tomography and the hypocycloidal movement since it gives the thinnest cut and maximum blurring beyond the plane in focus is the best tomographic movement for this purpose. The present study is concerned with the radiographic examination of the intratemporal course of the 7th cranial nerve from the fundus of the internal auditory canal to its exit via the stylomastoid foramen, and an attempt to assess the variation in diameter of the facial canal in referred cases with unilateral facial palsy.

Material

A total of 18 patients was examined tomographically. All these cases had been referred by Dr. H. Dayan of the Audiology Group of the Institute of Sound and Vibration Research, University of Southampton. All had been treated recently for a unilateral facial palsy. The first 3 cases were examined with the apparatus for linear tomography (Barrazzetti Craniotome, 1·0 mm focus) at the Wessex Neurological Centre, Southampton (E. H. B. Consultant Neuroradiologist). In none of these cases was it possible to produce tomograms of sufficiently good quality to visualise accurately the facial canals. The remaining 15 cases were therefore all examined with the apparatus for hypocycloidal tomography (Massiot-Philips Polytome, 0·6 mm focus) at the Royal Naval Hospital, Haslar (J. A. B. H. Consultant Radiologist). Only the radiographs of these 15 cases were further considered in this study, those of the first 3 being discarded.

Radiographic Technique

Initially three projections recommended by Lucarelli & Pompili (1962) were used and tomographs obtained of the entire canal.

(1) Lateral projection for demonstrating the vertical or mastoid portion of the canal, from the stylomastoid foramen to the so called 'second elbow'.
(2) Anteroposterior projection for demonstrating the horizontal portion of the canal, and
(3) Chausse's third projection (modified) for demonstrating the intrapetrous part of the canal.

So much anatomical variation exists from side to side in the same patient and from patient to patient, that preliminary course localisation is required on each occasion that the patient was positioned. Thereafter radiographs were made with a hypocycloidal movement of the X-ray tube at depth differences of 1 mm until the facial canal was adequately visualised. Patient co-operation during this intricate

procedure is so important that the technique of examination is unsuitable for use in children or even adults with low IQ's. Each exposure lasts 6 seconds and the facial canal was found to vary greatly in its position (eg. within the range of 2·4 cm. from the table-top in the lateral projection) thus in one patient with gross asymmetry 35 exposures were necessary before the vertical portion of the canal was adequately identified on the two sides. On average 12 exposures were made in each patient 6 a side.

While this radiation can be shielded and directed only over a 4 sq. cm. area of the head both radiologists were concerned at the magnitude of the radiation dose delivered to the patient in the course of an adequate examination of the facial canal by the techniques of Lucarelli & Pompili. For this reason projections (2) and (3) were abandoned after the first few cases and the project restricted to the examination of the vertical portion of the canal only using projection (1).

TABLE 1

Comparison between radiological and clinical findings in 15 patients with Bell's Palsy

Case No.	RADIOLOGICAL			CLINICAL
	Right canal visible	Left canal visible	Canal definitely narrower	Side involved
1	Yes	Yes	Left	Left
2	Yes	Yes	Right	Right
3	Yes	Yes	Left	Right
4	Yes	Yes	Left	Right
5	Yes	Yes	Equal	Right
6	Yes	Yes	Equal	Right
7	Yes	Yes	Left	Right
8	Yes	Yes	Right	Right
9	No	Yes (narrow)	Left	Left
10	Yes	Yes	Right	Right
11	No	Yes (narrow)	Left	Left
12	Yes	Yes	Right	Left
13	Yes	Yes	Right	
14	Yes	Yes	Left	
15	No	Yes	–	

Results

The tomograms of the 15 cases were viewed independently by the two radiologists and interpreted in the light of the following questions



Case 17.

1 Head of mandible
2 External auditory meatus
3 Orbit
4 Mastoid
5 External
6 Styloid process

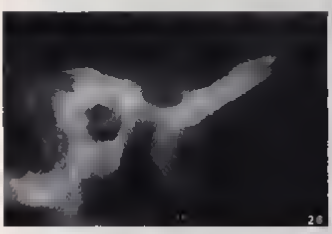


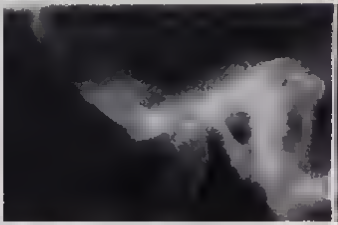
Fig. 1 Case 12

1 Head of mandible
2 External auditory meatus
3 Ossicle
4 Mastoid air cells
5 Exit canal of facial nerve
6 Styloid process

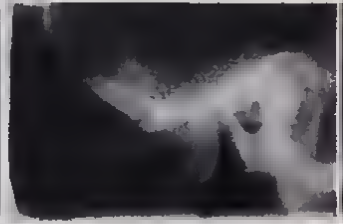
Case 1

Case 2 — R

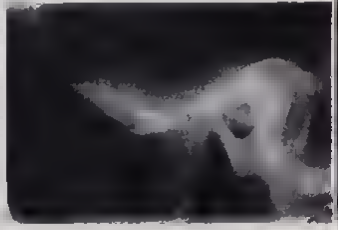






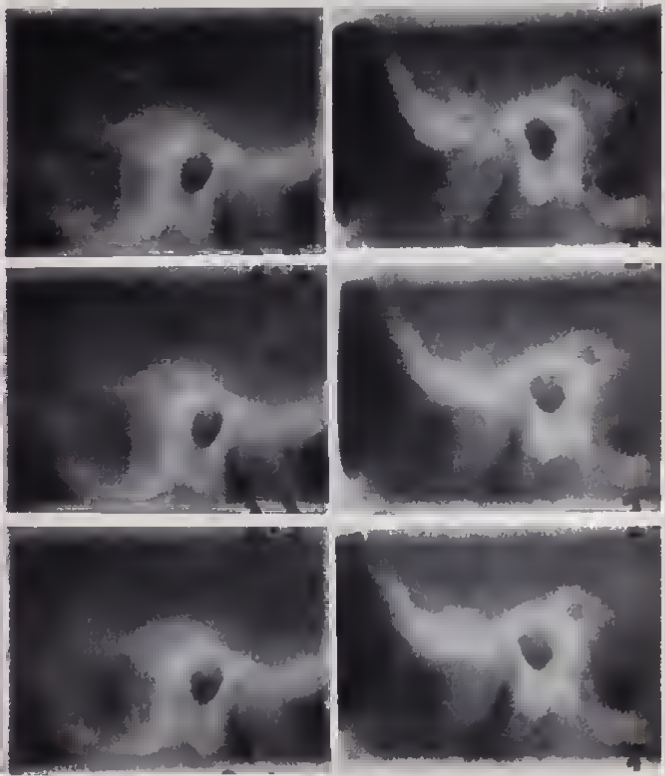






Case 10 — I

Case 10 — K



(1) Can I see the vertical portion of the right facial canal sufficiently clearly to judge its diameter?

(2) ditto the left canal?

(3) Which canal is definitely narrower?

Question 3 was applied after attempts to measure each canal separately had been abandoned as unreliable. It was found impossible radiologically to measure structures of only a few millimetres in size with any accuracy. Comparison of the size of the two canals was therefore adopted as the more accurate method of evaluation.

Table I gives the detailed results in the individual patients. Knowledge of the nerve involved clinically was purposely withheld from the radiologists until after they had interpreted the radiographs.

Conclusions

(1) The series of 15 patients, while valuable in providing the radiologists with an opportunity to become familiar with the appearance of 30 facial canals, is too small to possess any statistical significance.

(2) In this study no definite correlation could be shown between the affected nerve and smallness of the diameter of the vertical part of the canal or the stylomastoid foramen through which it passed.

(3) Radiation dose to the patient is a significant factor if the entire facial canal is to be examined adequately by the best methods at present available.

ACKNOWLEDGMENTS

We are indebted to C. M. T. R. G. Jacobs for taking the radiographs, to the Institute of Sound and Vibration Research for referring the patients and to Surgeon Rear Admiral E. B. Bradbury for the facilities to undertake the study.

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FIRST COMMISSION OF HMS FEARLESS

By Richard S Hambly

When originally asked to write an article on the first commission of HMS *Fearless* it seemed of no great interest to anyone except myself having served in the ship Since however the Prime Minister used her as conference base for discussions on Rhodesia she is back in the news again

At this point some background information on the ship is probably in order HMS *Fearless* is officially known as a Landing Platform Dock (LPD) but more affectionately as an Assault Ship She was commissioned in Belfast on November 25 1965 and is the seventh ship to bear the name The first two were small brigs the third an early paddle-steamer the fourth a torpedo cruiser while the fifth was the cruiser which led the fleet at the battle of Jutland The sixth a destroyer was sunk in the Mediterranean during World War II It is probably of some interest to note that the first three *Fearless* s could be accommodated in the dock of the present one

She is the largest ship designed and built for the Royal Navy since the war having a displacement of some 12 000 tons a length of 520ft a breadth of 80ft and mainmast 134ft high



Figure 1 HMS *Fearless*

As she is designed to work while stopped and docked down her armament is purely of a defensive nature being originally only four Seacat guided missile launchers each capable of launching four missiles These missiles are of the short-range visually-aimed and guided surface to air type

Soon after commissioning however these were augmented by the addition of



Figure

two Bofors guns mounted on each side of the wings of the flight deck, respectively for the defence of the ship in the event of attack by armed dhows.

On the assault or attacking side four large LCM9's are carried inside the ship in the dock. The dock is flooded by opening the stern gate and sinking the stern of the ship using ballast tanks which take up to 7,000 tons of water. Each of the LCM's can carry two of the largest tanks or up to 100 tons of stores, equipment etc. The forward end of the dock is connected by ramps to the vehicle and tank decks inside the ship. The LCM's embark their loads from these decks and then simply float out of the inside of the ship and proceed to the beach. On arrival at the beach the forward ramp of the landing craft drops down and the vehicles are able to drive ashore, leaving the LCM free to return to the ship for another load.

In addition to the LCM9's the ship carries four LCVP's which are carried on davits and are primarily used for disembarking personnel but can take two Land-rovers or their equipment if required.

A ramp also connects the lower vehicle and tank decks with the flight deck. The flight deck originally was the upper vehicle deck, but it was soon put to better use as a helicopter deck. Normally two Wessex helicopters can be operated at the same time from two spots on the port side of the flight deck, the starboard side being reserved for vehicles or troops waiting to board the helicopters.

The other primary role of HMS *Fearless* is as a Headquarter Communication Ship, having an Assault Operations Room in which military and naval commanders



Figure 3

with their respective staff can control a sea and land battle side by side having communications at their fingertips enabling them to contact land sea or air forces.

All this adds up to an extremely efficient and functional ship, although no one could say a pretty ship. Neither her two funnels nor her two masts match and from the side she looks rather unfinished — the forward half having all the superstructure and machinery while the after half looks empty and flat. Still looks are only skin deep and *Fearless* has proved over and over again what a seaworthy ship she is in bad weather.

The ship's complement is about 40 officers and 550 men of whom some 110 are Royal Marines and 100 Army personnel. As we regularly carried RAF helicopters and crew we were truly an inter-service ship with however almost no inter-service rivalry (except in sport) and a fierce loyalty to the ship by our sea-going soldiers.

The Sick Bay and Dental Surgery were not quite up to the expectations of a new ship. They were positioned forward under the Seacat deck and as well as being rather cramped for space they tended to get extremely hot once the ship reached the tropics. Originally two medical officers and one dental officer were carried but it was soon found that the embarked forces always brought along at least one doctor and trained Sick Bay staff so the ship's complement was reduced to one medical officer. The treatment room which doubled as an operating theatre was very functional but the main ward could only accommodate four beds which would not be sufficient in most emergencies.

The emergency operating theatre is in one of the embarked force messdecks and, while large and well equipped, had the rather unfortunate drawback of having an entrance too small to allow a stretcher case to be brought in. Most of these snags were discovered early in the commission and are being largely rectified during the current short refit in Plymouth.

The Dental Surgery was located alongside but not connected to the Sick Bay. Whilst being well equipped as both an operating surgery and a laboratory it was sub-standard as regards size being only 8½ft x 9½ft. When it is remembered that into this space was packed all the normal dental equipment, laboratory equipment, a desk, chair and cupboards as well as three people not much in the way of spare space was left. This was probably adequate in a UK type climate but in the heat of the tropics it became at times almost unbearable. Better air conditioning and a scuttle would have gone a long way towards making working life a lot more comfortable.

The actual dental work on board was not too difficult and probably most of my time in the early commission was spent working on Army personnel. As many of these as possible were made dentally fit for on arrival in Aden- they were to go to the Radfan mountains and stay there operationally for at least six months with minimal medical and no dental treatment available.

After the main work up off Portland in Spring 1966 we sailed from Plymouth in early July 1966 for trials in the Mediterranean followed by a spell in dry-dock in Gibraltar which allowed everyone a good run ashore. On the completion of

these trials we returned to the UK and Scotland for more trials and a final pre-embarkation spell of leave before sailing East of Suez in early September of the same year carrying an assortment of equipment ranging from guns and ammunition for Aden to war dogs for the RAF in Malta

We paused in Malta for an extremely pleasant three days before heading East again for the Suez Canal — that strip of water which used to separate the Mediterranean and the Red Sea! Once through the Suez we headed for Aden arriving there at the end of September A few days spent unloading all our stores and equipment followed by a short self-maintenance period allowed everyone to get ashore rabbit hunting At that time the trouble in Aden was mild compared with a year later and although there were curfews in force everyone went shopping and swimming with nothing more dangerous to contend with than the occasional shark swimming about off the beaches We all felt quite brave and safe however behind the shark nets the buoys of which were plainly visible a few hundred yards off shore It was with some surprise that we received a request a week later for divers to rig a shark net as there was none in Aden only the buoys!

Our next request was of a more serious nature and came from the Sultan of Muscat and Oman For more than a year terrorists had been living in a village called Hauf just on the South Arabian side of the Muscat border and raiding across the border at night. Repeated attacks by overland camel trains had come to nothing as the terrorists simply disappeared before the troops arrived We embarked a detachment of the Irish Guards and just before dawn a few days later we anchored a mile off shore The landing craft moved off into the gloom and a few minutes later helicopters took off to drop troops on the landward side of the village at the same moment as the landing craft hit the beach The village was quickly surrounded and in the ensuing interrogation over twenty terrorists were captured

This perhaps was the greatest proof possible in peace-time of the worth of an assault ship able to succeed where land forces had failed so often before

Following Aden we were unexpectedly called to South Africa to act as a troopship and withdraw the Irish Fusiliers from Swaziland back to Aden to be flown home Despite the complete unexpectedness of the South African visit the ship's company enjoyed every minute of the stay in Durban and when we revisited Durban a year to the day later on the way home many old friendships were renewed

Between these two visits however we steamed a long way starting by leaving Aden for Singapore for a much needed self maintenance period and a bottom scrape and paint in dry dock

Not long after arriving in Singapore the trouble in Hong Kong saw us steaming North East to relieve *HMS Bulwark* at this trouble spot Despite press reports in all papers to the contrary we saw little or no trouble and managed to enjoy ourselves to the full in this Jewel of the Orient With peace again in the colony we returned to Singapore to finish our docking period and prepare for our Spring Cruise This proved to be probably the highlight of the commission as we visited

Okinawa Japan and Korea in that order Each place was a complete contrast to the previous which added greatly to the variety and interest for all

Okinawa and Korea were largely American controlled and the traditional American hospitality was completely overwhelming By way of contrast we visited Hiroshima and were the first warship to visit this city since the dropping of the atomic bomb Despite this and the language barrier however the Japanese were excellent hosts and the visits to the islands of the Inland Sea were all that the storybook pictures of traditional Japan would have us believe

With much regret we waved goodbye to these lovely places and sailed south once more for Singapore and Admiral s Inspection A week or so were spent preparing for the inspection anchored off the lovely island of Langkawi when every one helped to paint and clean the ship between 'banyans' and hands to bathe off the beautiful white sandy tropical beaches

The inspection itself passed smoothly with everyone performing the usual evolutions — in our case the setting up of a beach hospital ashore and mock casualties on board in the most unlikely and inaccessible places Shortly after this we reluctantly said goodbye to the Far East and sailed once again for that trouble spot of the world Aden

Our primary role before the main withdrawal fleet arrived on the scene was to ferry back and forth to Bahrain with vehicles and equipment which couldn t otherwise have been evacuated in time

Altogether we completed three round trips calling at Dubai and Sharjah as well as Bahrain. Then on the third and last trip we were invited to visit Muscat as a sign of gratitude from the Sultan for our part in the capture of the terrorists just over a year previously This proved to be a fascinating country still living in the middle ages with people walking about at night with lighted lanterns and all wheeled traffic stopping from sunset to sunrise Perhaps the most interesting part of these trips however was not to be found on land at all but at sea where the most incredible variety of sea creatures abounded in great numbers

It was here we first saw dolphins attacking sharks and sharks attacking and eating giant squid of perhaps thirty feet in length Here too we saw large numbers of whales giant rays leaping high out of the water to rid themselves of parasites lumbering turtles looking remarkably at home in the sea and nasty highly coloured sea-snakes almost everywhere one cared to look This is probably the most densely populated stretch of water in the world and certainly the most fascinating and interesting to watch from the safety of a warship

Following this period of commission when the Army and Navy in Bahrain suggested we should paint a British Rail sign on the funnel instead of our amphibious warfare crest we settled down to a more or less dull routine anchored in Aden harbour covering the withdrawal

Again the comparative safety of a mile of water and a steel deck beneath one s feet made the trouble in Aden seem remote and unreal somehow We were often brought back to reality however watching tracer bullets criss crossing the night sky and listening to the sound of gunfire and explosions from ashore

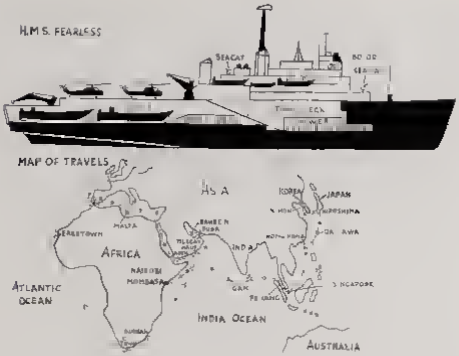


Figure 4

Finally the great day arrived and we awoke one morning to see our sister ship coming over the horizon to relieve us — we could go home and barring any unexpected hitches *en route* we should all be celebrating Christmas in our own homes

Due to the Suez Canal being closed we were forced' to sail south for another wonderful week in Durban before rounding the Cape and heading north for the last time to face nothing worse than an English winter foot and mouth disease and the Customs man

In all a very busy and varied commission taking us to places we never in our wildest dreams expected to visit and somehow finding the time to redecorate an orphans home in Singapore city. show 195 officers of Brigadier or Commodore rank or above round the ship. carry almost 8 000 troops and 1 300 vehicles whilst steaming about 60,000 miles throughout the various oceans of the world

Letter to the Editor

Sir

If you can find room in your correspondence column for a retired Army doctor I would like to say how very much I enjoyed Surgeon Rear Admiral Miles' fascinating article on The Care of the Injured in Adverse Conditions For one who has never been a surgeon to comment on the many important points in this most valuable paper could add nothing useful to its impact but I would like to join in the author's historical asides

First about the great wealth of resistance which can be summoned to withstand the ravages of quite extensive injury When Napoleon's army retreating from Moscow had to recross the ghastly battlefield of Borodino they found a living skeleton with shattered legs who had kept himself alive for over two months by feeding on the putrid flesh of dead horses and it was rumoured also by cannibalism Napoleon said that this poor wretch expired from joy on seeing his Emperor — a fair example of that monster's callous egotism

But now I must have a go at the author for suggesting that Nelson said Kiss her for me Hardy Tradition and the historians unite in believing that he said Kiss me Hardy and Hardy was in no doubt for he did kiss his little Admiral and dear friend not once but twice If we can believe Mr Beatty the surgeon and why shouldn't we Admirals and others may find it hard to reconcile such apparent sentimentality with the fact that Nelson is probably our greatest and certainly our best beloved military leader and it has even been suggested that he may have said Kismet Hardy Rubbish! Let the executive Admirals put what eyes they please to their telescopes but a Surgeon Rear Admiral whose good eye sees so clearly as does Admiral Miles the need for tenderness in the care of grievously wounded men can accept this side of his hero's character In another most affecting historical deathbed scene a more reserved though equally lovable hero showed just the same need Anderson don't leave me' said John Moore holding fast to his friend's hand) A deeply moving fact is that mortally wounded men in battle often call for their mothers I have heard them do so in English Scots Urdu and German The emotional lovable but undoubtedly vain Horatio Nelson certainly enjoyed the adulation and flattery with which he was surrounded in the Hamilton household and out of this grew as Admiral Miles says a deep and very real love for Emma Hamilton' but there is much to suggest that there was less of the ardent physical side to it than one might expect — that he needed affection almost indeed mothering But the result of this love was and I am sorry to have to say it to play havoc with his absolute sense of duty For Emma and her friend the Queen of Naples a terrible scheming woman for whom John Moore had no

use at all. Nelson did regrettable things — eg, the execution of Caracciolo — and virtually deserted his post to drive home across country in the Hamiltons' coach. This would never have done for the Army's hero the Duke of Wellington to whom duty really was his guiding star. But if this strikes a jarring note in a Naval journal let me quickly add that in the classic *Servitude et Grandeur Militaires* Alfred de Vigny chose Collingwood as the apotheosis of devotion to duty.

I am, etc.

F. M. RICHARDSON

Major General

Reference: Miles, S. (1968) *J. roy. nav. med. Serv.* 54: 215

Reviews

REHABILITATION OF THE LOWER LIMB AMPUTEE. W Humm MSRG Second Edition Pp 130 £5 illustrations London Bailliere Tindall & Cassell 28s

The title of this monograph suffices to indicate its interest to naval surgeons physiotherapists and remedial gymnasts It is graced by a foreword by Sir Reginald Watson Jones Sir Reginald makes the point that whereas in former times amputation used to be an excision and ablation final and for ever accepted by patient and surgeon alike as failure or at least as failure to regain normal and perfect function nowadays it can be regarded rather as the first step of orthopaedic restoration to a new and happy life No longer is something hung from the patient rather the lost limb is replaced by a fixture on which is part of him This book details how this can be achieved In its emphasis is placed not only on the psychological problem — the first obstacle to be overcome — but also on the physical problems and the possibilities of rehabilitation This is the second edition of the monograph and the recent trend towards early rehabilitation in this country has been emphasised by the addition of a new chapter This is a work of foremost importance to those who belong to the Royal Naval Medical Service It is well illustrated with photographs and drawings clearly demonstrating methods of rehabilitation and the techniques used P D G F

THE YEAR BOOK OF CARDIOVASCULAR MEDICINE AND SURGERY 1968 By Braunwald Harvey Kjeldsen Nadas Paul Wilkins & Wright Pp 459 Chicago Year Book Publishers Obtainable in UK from John Wiley & Sons Ltd Chichester 98s

Year by year the world literature of medicine increases by almost geometrical progression and it is now accepted that it is impossible for either subscribe to the journals or to read the published papers in any specialty We have therefore come to depend on monthly or annual reviews of the literature and one of the foremost publishing houses is Year Book Medical Publishers who have been producing year books in eighteen different fields of medicine since 1900 — surely a remarkable survival

This latest volume contains a refreshing series of abstracts of the papers published up to January 1968 The physician can enjoy summaries of recent published works on cardiovascular disease while the surgeon is provided with a review of the articles in this very progressive field of surgery Anyone who wishes to keep abreast of his subject must constantly refer to this admirable survey it is no short cut to information but it does open the door to the research and experience of different schools in all parts of the world J M C

MEDICAL TALES FROM BLACKWOOD Pp 306 + v London Wm Blackwood & Sons Ltd 21s

A collection of stories originally published in the Blackwood Magazine which make interesting reading for students of medical history The earliest story was one published in 1856 and throws fascinating light on the era of the body snatcher The latest appeared in 1964 and concerns the start of the strife in French Indo China

The stories of military medicine novel the period from the Napoleonic wars to the Anzin beachhead and point out remarkable similarities in the qualities required of nursing and medical personnel throughout the period J M Y

MAY'S DISEASES OF THE EYE Revised and edited by James H Allen MD 24th edition 430 pp 258 illustrations and 32 colour plates Edinburgh & London E & S Livingstone Ltd 90s + 4s 6d postage

A Manual of Diseases of the Eye written by Charles H May and intended for the student and general practitioner of medicine was first published in 1900 This is the 24th American edition of the textbook now revised and edited by Dr James H Allen of Tulane University Medical School

There have been 13 editions of the British version of the same text book first edited by Claud Worth together with May in 1906 and the latest edition revised by Lyle, Cross and Cook was reviewed in the *Journal of the Royal Naval Medical Service* (Winter 1968)

In addition there have been 12 Spanish 7 Italian 6 French 5 Dutch and 4 Portuguese editions not to mention those in Chinese, Japanese and Urdu so it seems that the book serves its intended purpose

The latest American edition has been revised rearranged in part and brought up to date, but it has to be admitted that there remains much which seems to be old fashioned and inadequate proof reading gives rise to occasional confusion Some new illustrations have been added but there is a nostalgic pleasure in seeing once again the girl with Hutchinson's teeth fearful rhagades and interstitial keratitis and the boy having a foreign body removed from his eye just as they were nearly 70 years ago in the first edition There is also a certain hilarious satisfaction in contemplating the sophisticated American ophthalmologist demonstrating diplopia with lighted candles!

Students in Britain will probably prefer the Lyle Cross and Cook edition but this well produced book will again be well received T C B

LECTURES IN MEDICINE By C W H Havard MA DM MRCP Second edition Pp x v + 399 London Staples Press 70s (Paperback 45s).

In this second edition produced only just over one year following the initial presentation four chapters have been omitted those on intestinal malabsorption pulmonary depletion psychosomatic disorders and viruses in disease In their place have been substituted ones on chronic adrenal failure adrenergic receptors and medical aspects of transplantation making as before a total of fifteen chapters. Some of the original sections have been rewritten and major additions and alterations made to other chapters These are seventeen extra pages and no additional seven shillings in price

The aim of the book as before is to review recent advances in medicine and in this respect it is tending to resemble other series of modern trends recent advances post graduate medicine etc but the second edition appearing so quickly after the first is sufficient evidence of its popularity and of the need that it is serving in medicine today

The book can be highly recommended to final year clinical students physicians studying for higher examinations and in fact to anyone wishing to become familiar with advances in medicine not always covered by standard text books of medicine There is a useful selected bibliography for each chapter to be found at the end of the book L G T

DISEASE IN INFANCY AND CHILDHOOD Richard B Ellis OBE MA MD FRCP and Ross G Mitchell MD FRCPE DCH Sixth edition Pp vi + 687 Edinburgh and London E & S Livingstone Ltd 80s + 4s 6d postage

This is the sixth edition of this well known book to have appeared in the past seventeen years, but the first with Professor Mitchell fully at the helm following Professor Ellis's untimely death three years ago but whose name has been retained in no authorship

The former can be congratulated on maintaining the high standards in this classic excellent middle-size book of paediatrics The general plan of this edition has not been altered but the whole text has been thoroughly revised and one new chapter added It is intended as an introduction to the senses of infancy and childhood for senior medical students and junior hospital staff but serves with limitations as a reference book for family doctors There is no preference of covering the wide range of normal child health or of elementary general medicine which should have been covered before this book is used in the study of paediatrics

The format remains very much the same and an attempt is made to consider disease occurring in particular age periods Thus congenital malformations of all systems are discussed in a single chapter covering over a hundred pages Four chapters emphasize the variety of diseases established before birth and within the first month of life and other chapters each range over several systems, preventing broad disease entities as they affect the child at particular age periods

This sound paediatric book is most certainly one which can be recommended to the groups of students and practising physicians for whom as stated above it is primarily intended but let us hope that in future editions some of the illustrations will be improved with the institution of new blocks J G T

ESSENTIALS OF CHIROPODY FOR STUDENTS By Katharine D Knipers and Michael J T Dalton Pp 220 London Faber & Faber 30s

This useful little book by Dr Knipers which was first published thirty years ago is now to its 6th Edition and the co-author is her son It covers the enlarged syllabus required by the Society of Chiropodists Apart from Chiropody Students it is also intended as a quick reference book for the practising chiropodist This style is that of a synopsis and it is divided into five sections Pathology Regional Surgery Diseases of the Skin Diseases of the Nails and Medicine

Its 206 pages with a glossary in addition are packed with information but at times it seems to have wandered from its subject — a full page is devoted to constipation and it might be asked what Peptic Ulcer and Barium's tumour of the jaw has to do with chiropody

Some observations are open to question for instance, trauma strains of plantar fascia and plantar muscles or infections eg gonorrhoea are responsible for calcaneal spurs.

Medical Officers attached to the Royal Marines would no doubt benefit most from this book although all naval medical officers might read it with advantage I wonder for instance, how many of us are aware of what a subsingual haloma is SCC

THE PHYSIOLOGY AND MEDICINE OF DIVING AND COMPRESSED AIR WORK By P B Bennett and D H Elliott Pp xvi + 532 London Bailliere Tindall and Cassell Ltd 160s

This book is one of the most important ones in this field since Hill and Haldane published theirs in the early part of this century It is more advanced than some produced for the sports minded doctor and at the same time more coherent and comprehensive than the various books which are the published proceedings of conferences or symposia In particular the various theories on decompression currently under serious investigation are excellently presented by their various proponents and some of the applications are written up in such a way that further light is shed on the confused waters Inert gas narcosis is also well covered although the controversy is more muted Oxygen and carbon dioxide toxicity respiration under pressure and the problems of respiratory equipment physiological effects of liquid breathing and artificial gills and of hydrostatic pressures the problems of saturation diving as exemplified by the French and United States programmes of living on the sea bottom are topics covered in separate chapters Decompression sickness in various aspects is well covered It is a pity that there is no chapter on commercial diving as well as the contribution on tunnel building to emphasise the point that this field of research is connected mainly with finding a safe means for man to achieve certain ends

There are bound to be some slips in a volume of this nature especially in the attempt to give premium ends in two forms but these were infrequent More serious perhaps is that the coverage could be more complete in a volume which is going to be most generally one which all future writers must refer to as past authors have had to refer to Fulton's Decompression Sickness (1951) Space might have been found for description of accidents in self-contained equipment for aspects of hyperbaric medicine physiology of temperature control and immersion for closed environment habitability and for submarine escape The disclaimer that transfer under pressure and similar matters are more engineering than physiology is valid but those topics mentioned above deserve more than an aside or passing reference in a book with this title

The description of decompression sickness is complete but some aspects of perspective in symptomatology and of aids in therapy could be detailed These defects however must not be considered to be more than minor blemishes in a work of such stature It should be gratifying to the Ministry of Defence (Navy) that it has on its staff two physiologists who command such respect that 23 eminent men contributed to the volume and it follows the long tradition that the Royal Navy had for advances in this field

The end result can be wholeheartedly recommended to all physiologists as one of the basic essential texts in this field as it will spur on work for the next decades

Reference FULTON J F (1951) *Decompression Sickness* London W B Saunders DEM

HANDBOOK OF COMMUNICABLE DISEASES AND SCHOOL HEALTH Pp 141 London J & A Churchill Ltd 15s

This little paperback provides a straightforward factual guide to general health and communicable diseases Though intended primarily as a means of rapid reference for the School Medical Officer it is of considerable value to all concerned with school health and to Service Medical Officers

The first seven chapters are devoted to such matters as general hygiene medical services in a residential school disinfection immunisation and problems of adolescence Thereafter the communicable diseases are considered in alphabetical order

It is unfortunate that the difficult problem of professional secrecy with regard to older teenagers should be mentioned under Promiscuity since it touches on medical confidences generally It is interesting that in the case of boys or girls over the age of 16 the Medical Defence Union allows some relaxation of the doctor's ethical obligation to his patient

In view of the stress that is laid today upon the transmission by sexual intercourse of trichomonas vaginalis the reminder that in many cases there is no question of this mode of transfer is welcome

It is of interest to note that the first edition of this book was published as long ago as 1885 certainly it can be said to have withstood the test of time. PJOM

INTRODUCTION TO CLINICAL NEUROLOGY By Sir Gordon Holmes Revised by Bryan Matthews Third Edition Pp viii + 187 Edinburgh & London E & S Livingstone Ltd 35s + 1s 3d postage

The late Sir Gordon Holmes was a master of neurology to a previous generation and this impressive little book was first published in 1946 It has now been revised by Dr Bryan

Matthews with some major alterations to the chapter on epilepsy and the addition of a section on neurology in infancy The intention of the work however which was to encourage an intelligent approach to neurology remains unchanged

There is no mention of treatment and little in the way of descriptions of specific diseases and the book is essentially a discussion of the significance of symptoms and signs of disease in the nervous system

This is a very stimulating and informative book which should be read by any physicians who are faced with neurological problems and which all medical men will find both interesting and profitable G J M T

THE PRINCIPLES AND PRACTICE OF MEDICINE Edited by A McGehee Harvey Leighton E Cluff Richard J Johns Albert H Owens Jr David Rabinowitz and Richard S Ross Seventeenth edition Pp xvii + 1472 London Butterworth & Co (Publishers) Ltd £7 18s

This text book of general medicine is a successor to Sir William Osler's book first published in 1892 and now emerges as a text book of medicine from the John Hopkins School of Medicine

It aims to emphasise clinical problems rather than disease entities and attempts to describe and define the way in which the experienced physician approaches the solution and management of such problems

There are those who would argue that the day of the comprehensive text book is over but the rapid extension of knowledge makes a volume such as this more necessary than ever provided that it is kept well up to date and is not too dogmatic

In placing their emphasis on clinical problems rather than disease entities the non authors have produced a text book of general medicine that is rather out of the ordinary but I am certain that their approach is the right one The text is straightforward and amply illustrated with clear diagrams and useful tables setting out the main points in the text There is for example an excellent table of the neurological manifestations of systemic disease which any candidate for Part I of the Membership would do well to commit to memory

It is inevitable that a book of this size is already beginning to be a little out of date by publication and this is no exception The references which are predominantly American do include the important work on the relevant subject but none appear which are later than 1965

This is the best general text book of medicine I have yet seen from the United States and although of necessity brief contains literature for further reading is quoted at the end of each chapter G J M T

ANAESTHETICS RESUSCITATION AND INTENSIVE CARE By W Norris and D Campbell Second edition Pp xi + 271 Edinburgh & London E & S Livingstone Ltd 30s + 1s 6d postage

This is the second edition of a popular book first published in 1965 The title is slightly misleading as regards Resuscitation and Intensive Care in that basically this book is an introduction to anaesthesia It contains a practical

The chapters and topics are well chosen introducing the realm to various situations in which he will find himself in his early days He will find advice on unexpected difficulties such as laryngeal obstruction oxygen therapy tracheotomy and inspiration management and so on

The authors have managed to include a great deal of information in the small space available This stems from their teaching experience which enables them to emphasise points which they know cause difficulty They also include many pieces of practical advice in passing

I was glad to see that the authors have described mainly current techniques and apparatus — students are rarely interested in history it is an interest which comes later

A disappointment was no chapter on anaesthesia and resuscitation in infants and children Children provide a substantial proportion of any practice and the call to the moribund child in casualty is not too uncommon To make room I would be prepared to sacrifice the sections on subarachnoid anaesthesia and supraclavicular brachial plexus block together with their accompanying diagrams

Praise must be given to the high standard of production, beautiful diagrams good paper and strong binding similar in font to the first edition which the reviewer can vouch for as proof against the various physical chemical and biological hazards of the theatre K R

ANAESTHESIA FOR OPERATING THEATRE TECHNICIANS By C A Foulis and Bridget Jupson Pp 242 London Lloyd Luke (Medical Books) Ltd 35s

This text book is intended to meet the syllabus requirements for the Institute of Operating Theatre Technicians examination in anaesthetics Only is shrunk at once by a general sum

larly in [illegible] called Introduction to Anaesthesia of which Dr Foster in nine months' time will [illegible] I like also paid sheds

Thus being a technician book most emphasis is placed on equipment and all the common items together with some less common are described The underlying principles are explained sizes which relevant are given and advice regarding maintenance and sterilisation included The DA and FFA candidate will find a quick run through this section of the book profitable particularly as there is a profusion of clear line drawings of apparatus culled from manufacturers' literature

There are useful appendices of size tables abbreviations alternative names and so on Other chapters are designed to give the technicians a basic understanding of anaesthesia and headings include Pharmacology Resuscitation and Intravenous Therapy and General and Local Anaesthesia Here I was less happy because although it made easy pleasant reading to an anaesthetist it would have been fairly hard going for the trainee technician unless he had a substantial grounding in Physiology Medicine and Surgery and some grounding in Physics and Chemistry

The author must have worked very hard to have assimilated and condensed so much technical information and the keen technician can be confidently recommended to buy this book both for study and reference K R

THE YEAR BOOK OF ANAESTHESIA 1968 Edited by Stuart C Cullen Pp 399 Year Book Publishers Chicago obtainable in UK from John Wiley & Sons Ltd Chichester 94s.

The usual Year Book pattern is followed in this volume Detailed abstracts are given of all papers relevant to anaesthesia published in English language journals in the year ending May 1968

The abstracts are written by various experts and are about three times the length of the normal summary At the end of most of the abstracts the editor adds a comment These comments rarely extend over more than three lines but they are searching pithy sometimes devastating but at the same time good humoured and a great asset to the book

The reviewer finds of most value the abstracts from journals which he does not normally see and which perhaps only occasionally publish articles of anaesthetic interest

For the ordinary anaesthetist this book can be a compact substitute for a pile of journals in the bedroom To anyone contemplating research access to this almost mandatory R R

ADVANCES IN MARINE BIOLOGY Edited by Sir Frederick S Russell Vol 3 Russell Findlay E Marine Toxins and Venomous and Poisonous Marine Animals Pp x + 402 London Academic Press Inc £4 4s.

The copy of this publication provided for review unfortunately read from page 255 to page 304 then from page 271 to page 336 next from page 305 to page 320 and finally from page 337 to page 384 These binding errors made reading difficult and irritating and detracted from what is undoubtedly an excellent review of a neglected but increasingly important subject The monograph is clearly written and very readable contains 8 tables 20 figures and over 300 references

Approximately 1 000 different species of marine life are known to be either venomous (producing a toxin which is transmitted by a bite or sting) or poisonous (possessing toxin in tissues) and the more important of these are included in this review

The introduction deals briefly with definitions history and folklore before considering the general chemistry and toxicology of marine poisons generally This subject which is complicated by the fact that no classification of marine toxins exists to date is particularly interesting

The following chapters contain a review of the literature on the venom apparatus chemistry and toxicology and the clinical problem of various species ranging from the unicellular protozoa (or plankton) to the poisonous and venomous fishes This last chapter is the most extensive and contains much previously unpublished information from the author's personal researches Well over 200 species of marine fishes including the stingrays scorpion fishes zebra fishes stonn fishes weevers toadfishes stargazers and some sharks rat fishes cat fishes and sturgeon fishes are known or thought to be venomous They are usually shallow water reef or inshore fishes occurring predominantly in the Pacific and over 100 of these are inshore though the two notorious catfish stingers of S E Asia are not mentioned So far as this part of the world is concerned although catfish stings are the commonest the stonefish is the most dangerous All venomous stings are excruciatingly painful and the traditional treatment with very hot water continues to be recommended and found to be the most effective

It is perhaps unfortunate that sea snakes are not included in this review as they probably cause as much trouble in S E Asian waters as catfish or stonefish but even so this monograph makes excellent reading and is strongly recommended especially to all those likely to visit the Far East or other parts of the Pacific J H S

MEDICAL AND SURGICAL EMERGENCIES Edited by John H Schneewind 2nd edition Pp 318 Chicago Year Book Publishers Obtainable in UK from John Wiley & Sons Ltd Chichester 47s

Medical and Surgical Emergences is essentially a Casualty Officer's Handbook Compact comprehensive and summarie it covers a wide range of emergencies with ursp advice and where necessary useful illustrations

A short introductory Part I giving General Rules Ten Commandments how to deal with the Acutely Ill or Injured Patient is possibly the most valuable section If this is read and understood it will prevent mistakes both clinical and administrative being made by hasty action and ensure a rational approach in casualty management

The second part of the book contains twenty chapters by different authors on all possible medical and surgical emergencies

The editor is to be congratulated on his success in ensuring that his contributors maintain a similar and concise style throughout There is no superfluous writing — facts and recommendations are given in carefully combined paragraphs allowing instant reference.

The first chapter on the Injured Hand is the longest and rightly so as this form of injury heads the list of industrial accidents

Finally and of the greatest importance is Part III on the Preparation for Disaster Today when even in peacetime, major accidents involving large numbers of casualties are all too common the National Emergency Services should ensure that they have some prepared mean of guidance which would well be based on these recommendations

It is an admirable production worthy of the whole publicity in the medical service

S M

MEDICAL SERVICES IN WAR. Edited by Sir Arthur Salusbury MacNalty KCB and W Franklin Mellor Pp xvii + 781 London HMSO Atlantic House EC1 Price 160s

A great number of books have been published in recent years outlining the problems facing the medical services in the 1939-45 war All have been of the highest standard and have been planned primarily as comprehensive books of information and permanent records The present publication however has an entirely new and refreshing approach in that it is almost a summary in one binding of the important experiences of the medical services not only of the UK but of Canada Australia New Zealand and India

Perhaps the most striking lesson to be learnt is that many of the research and development aspects of military medicine received considerable impetus and the advances achieved are today extremely valid It is so easy for medical men who have not experienced war service to overlook the fact that the achievements of those days were recorded and reference to them in many cases could save repetition of research investigations.

One feature is the importance which is given to morale as a factor in accepting statistics of stress as quoted in a reference to Field Marshal Montgomery who stated It is essential to understand that battles are won primarily in the hearts of men This view that Man is still the first weapon of war is as true today as ever before is spite of the great invasion of technology into military procedure

Other salutary reminders include the application of physiological principles in surgery the selection of personnel and important aspects of administration tropical medicine and hygiene in general

It is a book which can be read from cover to cover with continuing interest or used as a reference for information of many subjects from a purely geographical point of view It is certainly one of the best and most useful books in the series

S M

A PRIMER OF CARDIAC DIAGNOSIS By A A Luisada MD and G S Saiyani MD Pp xvii + 243 Illustrated St Louis Missouri Warren H Green Inc $10 50

Recent advances in the techniques of cardiac investigation have so changed the teaching of cardiology to the student that we have had to reorientate our approach to the subject No longer may we rank a diagnosis of cardiac disease on the basis of the history inspection palpation and auscultation instead we have to teach the intelligent use of ancillary aids by the radiology electrocardiography cardiac catheterisation angiocardiography, scanning or even cardiac biopsy This result has been more accurate diagnosis and therefore more efficient use of the potent new therapeutic agents

Dr Luisada Professor of Medicine at the Chicago Medical School has written widely on cardiovascular disease and with Dr Saiyani he has now produced this eminently readable volumn on the observation and investigation of the cardiac patient It is pleasing to see that there is still much stress on the importance of history taking and that true weight is placed on the clinical findings before the patient is subject to intensive investigations the latter something surprisingly include a forecast of the return of popularity for Kymography a technique which has largely fallen into disuse with improvements in screening procedure and the advent of catheterisation

This is a refreshing book attractively written and superbly produced Although it is directed at the student it would interest any doctor who wished to find concise information on modern cardiological investigation J M C

PRACTICAL FOOD INSPECTION By C R A Martin MB BS(Lond) DPH LRCP MRCS Barrister at Law Seventh edition Pp 758 Illustrations 194 London H K Lewis & Co Ltd £5

This revised edition of a standard work brings the practical food inspector and in particular the student up to date with the day to day problems of food and its inspection

It must be rare to find such a complete coverage of the subject in a single volume particularly one in which the text is so easily readable It tells us many things about food in addition to its inspection and this increases the interest it has for the general reader

For the Medical Officer of Health and particularly his food inspector it is indispensable and for students taking the examination for the Diploma of the Public Health Inspectors Education Board it provides essential reading

It is a pity that the price has to be so high D W G

ATLAS OF ROENTGENOGRAPHIC POSITIONS By Vivian Merrill Third edition Vol I pp xxi + 309 Vol II pp vii to 826 Vol III pp vii to 878 (All contain 16 page index) The C V Mosby Co St Louis USA Obtainable in UK from Henry Kimpton, 134 Great Portland Street, W1 £20 18s 6d

This is the third edition of the American equivalent of the well known standard British text of radiography by the late Miss Clark This edition has been expanded and is now published in three volumes The format makes it a more convenient reference book than the British equivalent The work is comprehensive and the radiographic instructions detailed and accurate The additional information to that required for radiographic positioning is extensive and should widen the knowledge of radiographers This background material displays the enormous dichotomy of our approach to medical technicians since some of it is very simple and seems abstruse But in general this background material to radiographic positioning increases the value of the book to radiographers

The general format and presentation of the volume is excellent The radiographic positions are well photographed and the line drawings are clear and grouped relevant to the text Each region commences with a basic anatomical review and is followed by single page descriptions and illustrations of the radiographic positions The American — or perhaps one should say Old English — spectrum of ascribing a particular radiographic position to its originators is followed but as a sub title to the anatomical heading of the radiographic position

It is obviously not to be used to supplant the accepted anatomical descriptions of radiographic positions

The three volumes each contain a comprehensive index and there is an extensive bibliography useful both to the practising radiographer and to radiologists

The book in every way meets the four purposes stated in the preface to the original edition in 1949 and it has been comprehensively up dated The inclusion of background reference as footnotes to the radiographic positions is excellent and useful It is to be hoped that some radiographers may be encouraged thereby to widen their conservative and often mechanistic approach to the difficult radiographic problem Used as a reference volume by radiologists in similar circumstances it has great value and may lead the diagnostic radiologist to consider afresh the basic problems in obtaining the best investigative projection to most particular diagnostic problems

This volume should be read by all radiographers to widen their basic instruction It is essential in all Schools of Radiography and would be useful in all X Ray Departments and particularly those in which students undergo practical instruction

A valuable but regrettably expensive reference book for Radiologists and Radiographers J A B H

THE PREVENTION OF COMPLICATIONS IN DENTAL SURGERY H C. Killey FDS RCS(Eng) FDS HDD RCS(Edin) LRCP MRCS and L W Kay MDS FDS RCS(Eng) LRCP M&CS Pp vii+228 Edinburgh and London E & S Livingstone Ltd 35s + 1s 4d postage

This book maintains the high standard set by the authors who are now well known for their clear concise and very expert publications It should be read by all who practise intend to practise or assist in a Dental Surgery

The complications listed are all drawn from the files and the records of the Medical Protection Society Many are sufficiently bizarre to alert the unwary to the risks of operating in a hurry

The contents have been arranged sensibly from the simple to the complex and the concluding chapter rightly gives advice by Medico Legal experts

There are very few illustrations. One or two simple diagrams would have saved a lot of the text, particularly in the chapter on Oral Surgery. The parish type of incision is condemned by the authors although gingival epithelial reattachment is not assessed.

Several interesting and little known gems of information are scattered throughout this text book which is highly recommended and should save a great deal of dental litigation. A.F.J.S.

Infectious Diseases: Epidemiology and Clinical Practice. A. B. Christie, MA, MD (Aberd), DPH, DCH. Pp. viii + 1047. Edinburgh and London: E. & S. Livingstone Ltd. 1964. 45s. 6d. postage.

This large book gives extremely good value for money. How can one write over a thousand pages on the so-called infectious diseases? If one reads this book one will find the answer as each disease is discussed clearly concisely and yet in detail. There are over 50 pages on food poisoning and Salmonellosis, on bacterial meningitis and on amoebic meningoencephalitis with 35 pages on brucellosis and 23 pages on toxoplasmosis and cytomegalovirus disease. With such detail it is easy to see why this is such a valuable book with most excellent colour photographs. After each chapter there is a very good detailed list of references, eg. 165 for the typhoid and paratyphoid group of fevers.

As the author states: I have tried to write for fellow physicians, for medical officers in the Public Health field, for post graduate students and general practitioners who see more infectious illness than are seen in hospital. In this respect he has succeeded, and the book can be highly recommended for anyone who wishes to have an excellent compact volume for easy reference. I.G.T.

Diagnosis and Treatment of Cardiac Arrhythmias. J. P. P. Slonk, MD, FRCP. Pp. x+234. London: Butterworths. 75s.

This is a new medium priced text book by an experienced cardiologist who expresses his own personal views on this small but important specialised section of his subject.

On account of the increasing installation of coronary care units cardiac arrhythmias are being diagnosed more frequently and one is becoming aware of their clinical importance and of the new methods of treatment that have become available. This aspect of arrhythmia however is only one of the problems dealt with in this book and can be found in the final chapter.

The basic elements of the subject such as anatomy physiology and the general concepts of arrhythmias are covered in the first two of the fourteen chapters. The various individual arrhythmias are then described with the recommended treatment followed by sections on the various aspects of heart block and digitalis intoxication.

The text is well written and easily followed with a concise explanation of each arrhythmia with regard to the underlying mechanism in terms of cardiac physiology. Inevitably there are many illustrated ECG tracings the majority of which have been well reproduced.

Many cardiologists and general physicians however will query the maximum efficiency of the recommended modes of treatment although the views expressed are essentially personal ones. Lignocaine is mentioned very briefly as are some of the other anti-arrhythmic drugs but there is good coverage of the electrical methods of controlling arrhythmias.

This book can be recommended as a good reference volume for inclusion in all medical libraries and will prove of value to many anaesthetists, physicians and thoracic surgeons in their attempts to avert or deal with intrathoracic crises. L.G.T.

Intrathoracic Crises. A. L. d'Abreu, A. Brian Taylor and D. B. Clarke. Pp. viii + 334. London: Butterworths. 84s. 6d.

This new book from a Birmingham University and Hospital team is a type of companion to the previously published books on Intra-abdominal Crises and Cardiac Emergencies.

Every aspect of crisis within the thoracic cavity is dealt with in detail. In an attempt to emphasise a practical approach the book has been divided into four sections dealing with symptoms, clinical features in association with radiology and management followed by cardiovascular crises and finally practical procedures. This division results in a degree of repetition but minimal omission and leads to a certain degree of friendliness when one attempts to find all the evidence relating to any one particular subject. eg. cardiac arrest can be found separately from cardiovascular crises and ventilatory obstruction is dealt with in its various aspects in each section of the book.

Once these minor problems are surmounted the reader will find much of value as the practical angle is more clearly emphasised than in most standard text books relating to pulmonary and cardiovascular diseases.

The photographs and line drawings are good but many of the radiographs are poorly reproduced, *eg.* Figures 24 (a) and (b).

As a reference book for use in medical libraries and the casualty department of hospitals this volume can be recommended essentially for its practical value. L.G.T.

News of the Service

OBITUARY

Frederick Arnold WILLIAMSON NOBLE FRCS Consultant Ophthalmic Surgeon to the Royal Navy since 1943 died at his home in London on February 27 1969

D P G writes

Mr Williamson Noble was born on July 26 1889 the son of G E Williamson Esq FRCS of Newcastle-upon-Tyne who was himself an Ophthalmic Surgeon He assumed the name Williamson Noble in 1921 having married in 1917 the Hon Sheila Black Noble daughter of the First Baron Kirkley of Kirkley

He joined the Royal Navy as a Temporary Surgeon in 1914 and was in active service during the First World War being in a ship which took part in the Battle of Jutland a memory which was always a source of great satisfaction to him and he was delighted when in 1943 he was selected to replace the late Sir Arnold Lawson as Civilian Consultant Ophthalmic Surgeon to the Navy

Many Naval Ophthalmic Surgeons past and present will readily acknowledge a great debt which they owe to this particular Consultant whose interest and advice and practical assistance were never sought in vain Williamson Noble was of a very inventive turn of mind and was always producing gadgets and modifications of instruments designed to make the practice of Ophthalmology less laborious and more efficient It seemed a pity to those who knew him well that he did not devote more of his undoubted ability to fields of research to which his enquiring mind would appear to have been most eminently suited

He always gave an excellent clinical opinion and was very pragmatic regarding matters of treatment and general management He was a sound if not spectacular practical surgeon and his kindly and optimistic attitude towards the patient's problems made him extremely popular especially with women and children to whom his gentle personality had a special appeal

He was an excellent host and had some amusing characteristics one of which was his attention to details of expenditure Some of us can remember being lavishly entertained to an expensive dinner after which one would be invited to proceed back to Harley Street for further hospitality by public transport

Williamson Noble devoted his life to Ophthalmology and had few outside hobbies

He was a loyal son of St Mary's Hospital a devoted Cambridge man having at one time received a rowing blue and a very fervent supporter of Naval medicine

He had two sons one of whom lost his life on active service in 1945 I will always be grateful myself for the many occasions upon which he supported me during periods when I needed his invaluable professional advice. The steady progress of Naval Ophthalmology and the rise in erudition of those who practise it were a source of perpetual delight to him

He is survived by his wife and his son whom deep sympathy will help in their great loss

Surgeon Rear Admiral Richard Lome Gibbon PROCTOR CB MB ChB FRCP DPH died on May 10 1969 at the age of 69

He entered the Royal Navy as a Surgeon Lieutenant on December 29 1924 was promoted to Surgeon Lieutenant Commander on December 29 1930 to Surgeon Commander on December 29 1936 to Surgeon Captain on December 31 1946 and to Surgeon Rear Admiral on November 14 1955 He retired on November 30 1958

R W M writes

Surgeon Rear Admiral Richard Lonis Gibbon Proctor was the eldest son of the Reverend R Gibbon Proctor BD of Dublin and was born on May 13 1900 He was educated at Camp

hull College (Hull) and in 1918 joined the Cadet College of the Indian Army at Quetta.

After the war he returned home to study Medicine at Trinity College, Dublin where he qualified as MB, BCh in 1924 and entered the Medical Service of the Royal Navy in the same year. After serving in various ships, he specialised in Clinical Pathology, Hygiene and Preventive Medicine and became MRCP(D) in 1931, MD in 1936, DPH in 1937 and FRCP(D) in 1935.

He was Clinical Pathologist at RN Hospital Plymouth 1935-37 and at RN Hospital Haslar 1938-41. He was Naval Medical Officer of Health, Rosyth 1941-44, Alexandria 1944-45, Malta 1945-46 when he was promoted to the rank of Surgeon Captain and at Chatham 1946-51. He was Assistant to the Medical Director-General from 1951-55 and after his promotion to Surgeon Rear Admiral in 1955 was Deputy Medical Director General till his retirement in 1958.

He was appointed CB in 1958 and Queen's Honorary Physician in 1955. He had become an Officer of the Order of St John in 1952 and was promoted to the rank of Commander of the Order in 1961.

Richard Proctor had a useful varied and interesting career. He was not only a Clinical Pathologist and Naval Medical Officer of Health, but also a knowledgeable physician and wise administrator. He was still active after his retirement from the Royal Navy in work with the Army Medical Service and he and his wife were devoted supporters of Rochester Cathedral, in whose precincts they had lived.

He was good natured and kind with a pleasant quiet sense of humour and, while maintaining a high standard in his professional work, never neglected the social side of his Service life.

Deepest sympathy is extended to his wife and family.

Surgeon Captain JAMES GORDON DANSON, RN (Retired), MD (Aberdeen), FRCP (Lond), died on June 18, 1969.

James Danson was born at Aberdeen in March 1885, the fifth son of the Rev James Danson, later Dean of Aberdeen. He was educated at Aberdeen Grammar School and the University of Aberdeen where he qualified in April 1908. He held house appointments under David Findlay, the Professor of Medicine, and Sir Henry Gray Dalton, moving south to further appointments at the Royal Chest Hospital, City Road, and Brentwood Mental Hospital. He joined the RN Medical Service in August 1910 and subsequently saw service in HMS *Inhaltes* and HMS *Warrior* on the Home and Mediterranean Stations.

He was at RN Hospital Chatham when the world pandemic of influenza hit Southern England. The dramatically sudden onset on the disease and its frequently rapid downhill course through staphylococcal pneumonia and bihotrope nyanos s to n sudden termination was something new to medical experience, and Dinkin Danson's previous service at the Royal Chest Hospital stood him in good stead.

In 1919 he went to RN College, Dartmouth which he loved, but the turning point in his career came in 1921 when he was granted a course in medicine at Queen's Square, the National Heart Hospital and Westminster Hospital. His decision made on clinical medicine as a specialty and passed his MD (with commendation) the same year, after which he spent four years at RN Hospital, Malta. He was promoted Surgeon Commander in 1924.

In October 1926 he passed his MRCP (London), a rather rare event in those far off days. At the final examination the President of the College remarked that it was unusual to get a candidate from the Navy and of such maturity years, to which Dicky Danson replied 'Sir I am faced with the disability of increasing deafness and may soon have to abandon all hope of a clinical career' and I am determined to go down with my colours flying.

He was promoted to Surgeon Captain in 1935 and appointed to RN Hospital Chatham where history in a minor way repeated itself when an outbreak of severe influenza overwhelmed the facilities of the hospital. Illness thinned the ranks of the Sick Berth and Medical Staff, the Medical Specialist (Surgeon Commander Preston) died, and the main brunt of the clinical work devolved on the Surgeon Captain.

In 1937 he went to RN Hospital Haslar as Professor of Medicine. It is no reflection on other occupants of the chair to say that the RN Medical Service never had a better one. He took infinite care in preparing extensive notes for the newly joined Surgeon Lieutenants, on conditions they were likely to meet more especially in the field of tropical medicine and during the war years which followed many a Service doctor had reason to be thankful for Dickie Danson's compendiously and beautifully written notes.

During the war he served as SMO(M) at the RN Hospitals of Barrow, Gurney, Plymouth, Invergordon and Liverpool. He was officially retired in 1941 but continued in uniform until December 1946. He was bravely severely handicapped by deafness and shortly after leaving the Navy he was threatened with blindness from a bilateral cataract. The first operation was unsuccessful and for a space of three years he was virtually without sight until a second operation in 1952 restored his vision sufficiently to allow him to read and write. He retired

to Bath where he spent the last 16 years of his life. These years were marred by his deafness and poor eyesight, the onset of angina and finally a carcinoma of the larynx, all of which misfortunes he faced with astonishing fortitude and good humour. His mind remained clear to the last when he could still joke about the damned tetrodon that had invaded his larynx and threatened to remove one of his few remaining faculties, that of speech.

He was a cultured man in the true meaning of the word. He could read both French and German with a fluency approaching that of English and what is perhaps more astonishing, he taught himself to read Braille when his sight failed. He had a great love of country houses, especially those with Adam interiors and Capability Brown gardens, and of 17th and 18th century architecture in general.

He was already a Surgeon Captain when he married Grace, the daughter of the Bishop of Carlisle. His married life was a very happy one, though much marred in latter years by his wife's ill health and increasing disability.

A truly great officer and gentleman has departed from us, the like of whom we do not often meet.

MARG writes:

The well beloved Service character may well be a feature of the past, indeed he could be an anachronism in the present age. Dinkin Dawson filled this role compliantly. I first met him during the winter of 1935/36 when as a junior Surgeon Lieutenant I spent some months at RN Hospital Chatham, where he was Surgeon Captain(M). I had heard a good deal about him, his learning, command of language, written and spoken, and the high standard of work he expected from all members of his Division, so soon as these was I disappointed.

My first impression was that he was a reincarnation of Dr Samuel Johnson, pinthone and rather obese, dictatorial and dogmatic with a wonderful command of the English language backed by a powerful intellect. He was exacting but never unfair, indeed he was incapable of anything mean or petty and always prepared to back his juniors up to the hilt.

In spite of the difference in age and rank a friendship developed which was to last till the day of his death. At any milestone in my career, Service or professional, I was sure to receive a letter from Dinkin Dawson peppered in forthright Johnsonian English, expressing his pleasure, giving recent news and outlining his views on the ills of the world and how to correct them.

He was utterly devoted to his wife who suffered much ill health in the last decade of her life, and whom he continued to look after with complete devotion until she died two years ago. After her death he wrote me a poignant but truly wonderful letter, he expressed his great sense of personal loss and his dread of the funeral. Those crude but necessary earthly formalities which we must suffer after which we will be in peace and we will be able to communicate across the great divide.

It was a remarkable letter which could only have been written by a remarkable man.

Surgeon Captain (D) Arthur Thomas DALLY RN(Retd) died on March 4 1969 at the age of 77.

He entered the Royal Navy as a Surgeon Lieutenant (D) on April 26 1915, was promoted to Surgeon Lieutenant Commander (D) on April 26 1921, to Surgeon Commander (D) on October 1 1935 and to Surgeon Captain (D) on November 15 1941. He was placed on the Retired List on December 16 1948.

Surgeon Commander J W L CROSEILL MD ChB RN(Retd) died on March 4 1969 at the age of 64.

He was born on June 15 1904 and was educated at Leeds Central High School and the University of Leeds, graduating MB ChB in 1927. He entered the Royal Naval Medical Service as a Surgeon Lieutenant on October 18 1928 and was promoted to Surgeon Lieutenant Commander on October 18 1934, to Surgeon Commander on October 18 1940 and was placed on the Retired List (own request) on August 31 1957. He was secretary of the Royal Naval Personnel Research Committee from 1950 to 1957.

After he left the Navy he became a lecturer in forensic medicine at the London Hospital and for two years assistant editor of *Abstracts of World Medicine*.

We offer our very sincere sympathies to his wife and son.

Warrant Master Lieutenant Commander J T L BURNS, RN(Retd) died on February 15 1969 at the age of 62.

He was promoted to Commissioned Warrant rank on August 12, 1945 and to Senior Commissioned Warrant Officer on April 1 1951. He was placed on the Retired List in that rank on May 12 1956.

HEBC writes:

I first knew Jimmy Burns at the end of the war in RN Sick Quarters Portkil – "doon the waiter" on the Gareloch and I could wish for no better right hand man and friend

He then served for several years in the Tropical Research Unit under the command of Surgeon Captain F P Ellis in Singapore and later in Cambridge

On his retirement Jimmy bought a small farm at Bracklesham Bay on the Selsea Peninsula He always said that he remained an Irish countryman at heart and shore on he had the green fingers for the farm prospered mightily

The way in which he and his wife, Betty triumphed over her crippling illness was an inspiration to their many friends old and new and a visit to the farm was always a happy occasion

A few years ago he sold the farm and went to live at Torremolinos in Spain as the climate appeared to be of benefit to his wife's illness

Our deepest sympathy goes out to his wife and married daughter

QUEEN'S BIRTHDAY HONOURS 1969

Officer of the Order of the British Empire

Surgeon Commander G A R Gird MA LMSSA DPH

QUEEN S HONORARY SURGEON

Surgeon Captain James Watt MB MS FRCS Professor of Naval Surgery
Surgeon Captain R F Phillips, OBE, MB BS DO

QUEEN S HONORARY PHYSICIAN

Surgeon Captain P J O Meara MB ChB MRCS LRCP DPH

HIGHER QUALIFICATIONS

Surgeon Commander E P Beck — AFRACS
Surgeon Lieutenant Commander S G Scanlon — DLO
Surgeon Lieutenant Commander A J Revell — FFARCS(Eng)
Surgeon Lieutenant Commander D A Lammimann — FFARCS(Eng)
Surgeon Lieutenant Commander P J Banfield — Dip VEN(Liverpool)
Surgeon Lieutenant D Wilson — DObstRCOG
Surgeon Lieutenant A H Bowen — DObstRCOG
Surgeon Lieutenant M A McKenna — DObstRCOG
Surgeon Lieutenant D L McCarthy — DObstRCOG
Surgeon Lieutenant M J Harley — DObstRCOG

PROMOTIONS

To Surgeon Commodore and as DMDG(N) A O'Connor MVO MB BS MRCS LRCP FFARCS

To Surgeon Lieutenant Commander G M E Sewell MB BCh Miss J R Newell MB BS LRCP MRCS M B Ransom ME ChB

To Surgeon Lieutenant Commander (D) P G Edwards, LDS

To Surgeon Lieutenant G P H Mason MRCS LRCP B J W Progree MB ChB R A Cavanagh MB ChB M F Hennelly MRCS LRCP J J Halliday MB BCh MA J A Quinn MB ChB A P Steele Perkins MB BS

TRANSFERRED TO PERMANENT LIST

Surgeon Lieutenant Commander A C Chakravetty MB BS

RETIREMENTS

Surgeon Vice-Admiral Sir E D Caldwell KBE CB QHP MD FRCP(Edin) FRCP(Lond) 1 1 68
Surgeon Rear Admiral D P Gould CB QHS DSc MD MCh FRACS(Oph) FRCS(Eng) DOMS
Surgeon Captain T H B Weston QHS MRCS LRCP G Hayes VRD MB BS FRCS
Surgeon Captain (D) F T Henton LDS
Surgeon Captain (D) D L Goodridge QHDS LDS HDD RCS(Eng) RCS(Edin)
Surgeon Commander T S Inw MBE MB ChB DO
Surgeon Commander W Cullin MD ChB
Surgeon Commander (D) P S Marshall LDS RCS

TERMINATION OF SHORT SERVICE COMMISSION

Surgeon Lieutenant A J Hurst MB ChB
Surgeon Lieutenant (D) I R Kenny BDS and G E Rinh BDS

WARDMASTERS

Promoted to Wardmaster Lieutenant Commander H E J Davies
Promoted to Wardmaster Lieutenant A T Prescott A C Mackay and R C Gray

Highest Qualifications

Wardmaster Lieutenant A T Prescott — ARAeS

Retirement

Wardmaster Sub-Lieutenant D Hucklin (Invalided)

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

QUEEN'S BIRTHDAY HONOURS — 1969

Member of the Royal Red Cross (First Class)

Miss C F J Cookn Principal Matron Inter

Ordinary Associate of the Royal Red Cross (Second Class)

Miss E M Northway Superintending Sistnr
Miss E H White Head Naval Nurse
Promotions To Superintending Sister/Matron Misses S R P Barton and A M Tynan

New Entries

Misses J E Halliday J Viney S F Murray P Bell C Brandhunt A R Cooper M Gibson A J Arnold J Bennett, M P Campbell P E Boulten and Mrs J F Campbell

Retirements

Miss M E Myms OBE RRC Principal Matron
Miss M F McGrath Superintending Sister (Released on marriage)

ROYAL NAVAL RESERVE

Promoted to Lieutenant Commander W Herns and G H de G Hunter
Retired Surgeon Captain E C Glover VRD + Surgeon Commander J C J McGowan VRD Surgeon Lieutenant-Commander E J Williams R M Foster and H Bodsworth Surgeon Lieutenant-Commander (D) A E Burford, VRD

Notice

THE EDITOR invites medical officers to send in original papers on professional subjects travel personal experience etc. Items of news and matters of interest to the naval medical service will be welcomed from ships and establishments on home and foreign station. Notices of births marriages and deaths are inserted free of charge to subscribers.

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Articles and communications may be sent to the Editor at any time. **They should be clearly written or, preferably, typed and sent in triplicate** to the Editor, RN Hospital, Haslar, Gosport, Hants.

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Editorial

Our sincere good wishes for very many years of happiness in retirement go to Surgeon Vice Admiral Sir Dick Caldwell We also hope that he will remain in good health and find a rewarding outlet for his many talents Naval Medical Officers will always be grateful to Sir Dick for the personal interest he showed in their welfare and his patient and persistent efforts to secure the best possible career structure and professional opportunities for the Medical Branch

At the same time we are equally pleased to welcome his successor, Vice Admiral E D Bradbury and wish him well during his term of office

A PERSONAL NOTE

May I switch from the Editorial We and say how very much I have enjoyed leading the Editorial team for the past eight years and thank them and, in particular, Mrs Joan Reynolds for their patient and encouraging support I find leaving the Navy after 30 years a frightening experience but it has all been very rewarding fun The Journal surprisingly enough has survived many setbacks mostly financial, and still lacks 100 per cent support from Serving Medical Officers This I have never understood I hope my successor Surgeon Rear-Admiral James Watt will recruit more subscribers and enjoy as much as I have the many interests and contacts which Editorship of the Journal produces And so at last it's 'goodbye' to you all and good luck

STANLEY MILES

Articles

DRUGS FOR THE CANCER SURGEON

By James Watt

HISTORICAL

Cancer chemotherapy was practised by the ancient Egyptians and cytotoxic materials were used by physicians in ancient Babylon in the sixth century BC. The Baghdad surgeon Rhazes (Fig 1) brought chemistry into medicine in the ninth century AD (Miller 1850) and Arabian interest in the subject became intense when the works of Jabir provided the first text of Greek and Persian chemistry (Martí Ibanez 1962) for the benefit of clinicians. Lassauer in 1865 treated leukaemia with potassium arsenate and Coley (1894) introduced cytotoxins to surgery when he employed the toxins of streptococcus pyogenes and bacillus prodigiosus to treat inoperable bone sarcoma the tumour disappearing in three of twelve cases. However the real impetus to modern cytotoxic therapy was provided by World War II and



Fig 1 Rhazes (850-932 AD) *Reproduced by kind permission of the Trustees of the Wellcome Historical Medical Library*

Gilman and Philips (1946) were first to publish an account of the biological and therapeutic effects of sulphur and nitrogen mustards. Wilkinson and Fletcher (1947) followed with the results of their work in Britain.

An important new technique was discovered by chance with the accidental injection of nitrogen mustard into the brachial artery of a patient suffering from Hodgkin's disease (Klopp, Alford, Bateman, Berry and Winship 1950). Vesication and ulceration of the limb followed and later resolution of the mass, thus indicating a new method of treating malignant disease localised to a single region of the body with a readily available blood supply.

Recent biochemical and microbiological research has extended the scope of cytotoxic therapy, introduced new agents and determined more exactly their specificity and site of action within the malignant cell. Indeed, over 400 000 chemical compounds have been tested for cytotoxic activity since 1942 (Higgins and White 1968) and Hirschberg (1963) reviewed 2 300 papers presented between 1945 and 1958.



STRUCTURE OF D N A. FIBRE

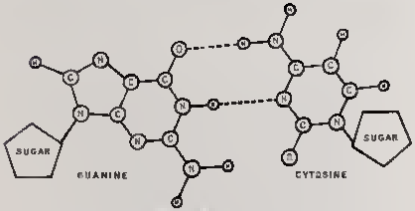


Fig 2 *Arrangement of nucleotides in DNA fibre.*

An important contribution to our understanding of cell division and the transfer of hereditary information carried by deoxyribonucleic acid (DNA) to the chromosomes was provided by Watson and Crick (1953) when they discovered the DNA fibre to be a double alpha helix, each strand running in opposite directions and cross linked by weak hydrogen bonding of pairs of nucleotides, each consisting of a purine or pyrimidine base–the 5-carbon sugar, deoxyribose, and phosphoric acid (Fig 2). In the same year Chargaff (Chargaff and Davidson 1955) had demonstrated

mandatory base-pairing between the large purine and small pyrimidine bases in coded sequence specific for each organism This coded information is transferred to cytoplasm by single-stranded messenger ribonucleic acid (mRNA) and there it is scanned by the ribosomes acting rather like the electromagnetic heads of a tape recorder, to enable transfer ribonucleic acid (tRNA) to link up in pre-determined order, the amino acids they carry In this way the long chain protein molecules are formed under the influence of enzymes which are themselves protein Cytotoxic drugs may act in a variety of ways They may prevent the DNA replication essential for cell division or disrupt cell metabolism either by depriving the cell of essential building blocks or by inhibiting enzymes and chemical factors essential to normal function (Fig 3) They may be considered in three main groups (1) alkylating agents (2) antimetabolites and (3) a group of miscellaneous agents of somewhat uncertain action

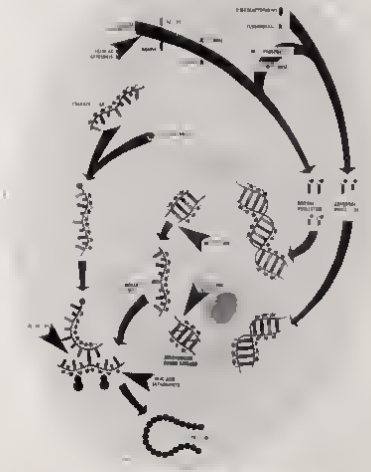
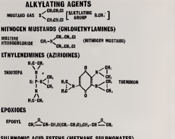


Fig 3 *Site of action of cytotoxic drugs*



ALKYLATING AGENTS
MUSTARD GAS
ALKYLATING GROUP
1. NITHOGEN MUSTARDS (CNLOHETNYLAMINES)
MUSTINE HTIIROCHLORIDE
(NITHOGEN MUSTAHII)
2. ETNYLENEIMINES (AZIRIOINES)
TNIOTEPA
THENIMON
3. EPOXIOES
EPOOYL
4. SULPNONIC ACID ESTENS (METNANE SULPNONATES)
HUSULPHAN (MTLERAN)

Fig 4 [illegible]



Fig 5 [illegible]

ALKYLATING AGENTS

Alkylating agents fall into four main groups all capable of adding their highly reactive alkyl group to other molecules (Fig 4)

Alkylating agents are radiomimetic they have a short half life and the more effective bifunctional varieties probably bind adjacent guanine bases to short circuit the co-axial double helix of DNA during the early interphase stage of the mitotic cycle (Brookes and Lawley 1961) This has chromosomal implications leading to the death of the cell and manifested by transverse splits of the centromeres chromosome fragmentation and despiralisation and chromatid breaks and interchanges (Koller 1958 Revell 1958 Loveless 1966) (Fig 5)

Alkylating agents act best upon rapidly dividing cells thereby indicating their usefulness and limitations for while they are speedily fixed by malignant cells in mitosis their action is unselective and affects also the actively dividing cells of the gastro-intesunal tract and haemopoietic tissues

In an endeavour to reduce toxicity and evolve specificity alkylating agents have become more sophisticated and attempts have been made to attach the twin alkyl weapons to transport molecules capable of reaching the precise target area within the malignant cell (Bergel 1961) The speed of reaction is determined largely by the hydrogen ion status of the carrier Nitrogen mustard s methyl carrier being a strong base causes its chloride ions to separate rapidly when in contact with acidic neoplastic tissue whereas the weaker bases of melphalan and chlorambucil react more slowly Cyclophosphamide (endoxana) is an enzyme dependent mustard inactive until its phosphoramide linkage is broken down by intracellular enzymes Mannitol mustard was designed with a sugar carrier to facilitate its passage across cell membranes Uracil mustard transports its reactive groups by means of one of the pyrimidine bases essential to DNA synthesis The effectiveness of phenylalanine mustard (melphalan) in treatment of malignant melanoma has been attributed to its utilisation by melanoblasts in the synthesis of melanin pigment but it is more likely that the agent becomes incorporated into protein molecules as a rogue amino acid inhibiting essential enzyme activity

ANTIMETABOLITES

The role of the antimetabolite group of agents can best be understood in relation to normal nucleic acid and nucleoprotein synthesis (Fig 6) Purine and pyrimidine bases combine with the 5-carbon sugars deoxyribose or ribose and are then called nucleosides which in turn are esterified with phosphoric acid to form the nucleotide cross links of the DNA and RNA chains Folinic acid acts as co-enzyme in the synthesis of the primary purine and pyrimidine building blocks and also some essential amino acids It accelerates the metaphase of the mitotic cycle and enables mRNA to carry the genetic code from the DNA in the nucleus to the ribosomes in the cytoplasm (Jacobson 1966) While alkylating agents only affect those cells about to divide antimetabolites act by competitive inhibition of nucleoprotein synthesis This may mean either the supply of counterfeit building blocks which become incorporated into the DNA and RNA chains or antagonism of reactions anywhere along the line

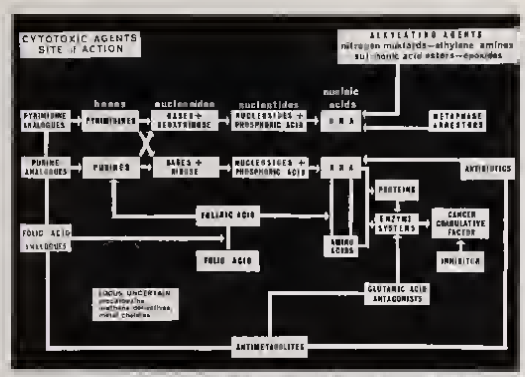


Fig. 6 [illegible]

ANTIMETABOLITES

PURINE ANALOGUES

ADENINE



6 MERCAPTOPURINE



PYRIMIDINE ANALOGUES

URACIL



5 FLUOROURACIL



FOLIC ACID ANALOGUES

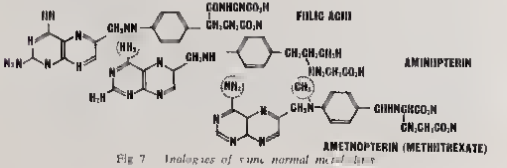


Fig. 7 *Analogues of some normal metabolites*

The antimetabolites probably fall into five broad groups according to their site of action (Fig 7) (1) analogues of purine and pyrimidine bases such as 6-mercaptopurine and 5-fluorouracil and their nucleosides (2) folic acid analogues like methotrexate This has the advantage that, when given intra arterially to perfuse a single region of the body its corresponding metabolite folinic acid or citrovorum factor may be given parenterally to protect the vulnerable blood forming organs (Sullivan Miller and Sikes 1959) (3) glutamic acid antagonists the alkaloids obtained from the Madagascar periwinkle, vinblastine and vincristine (4) antibiotics such as actinomycin D and C and certain new antibiotics which appear to have no real application to surgical conditions (5) enzymes like L-asparaginase

When analogues of the bases become incorporated into DNA structure altered biochemical sequences cause mutations during DNA replication Indeed the combination of a suitable antimetabolite with an alkylating agent is common practice and widespread metastases from carcinoma of the breast have responded rapidly to such combination therapy (Greenspan 1966)

The vinca alkaloids probably interfere with utilisation of glutamic acid (Johnson Armstrong Gorman and Burnett 1963) either preventing its incorporation into the amino-acid chain of enzyme molecules or blocking the action of glutamic acid in enzyme systems (Weber 1963) They may also act like cortisone as a spindle poison arresting mitosis at the metaphase (Palmer Livengood Warren Simpson and Johnson 1960) Bone marrow depression has to be watched carefully although these plant extracts appear to depress white cells more than platelets

Antibiotics appear to interfere with the synthesis of mRNA (Slotnick 1960 Butler 1964) Apart from actinomycin D antibiotics have not been found of much value in cancer chemotherapy associated with surgery Mytomycin C has been used in the treatment of advanced gastro-intestinal cancer (Moertel Reitemeier and Hahn 1968) but is more toxic and is not considered to have any established therapeutic advantage over other agents The new antibiotic cytotoxins such as daunomycin rubidomycin and adriamycin have mainly been used in the treatment of leukaemia and are highly toxic For this reason it is suggested that they should merely be used to induce tumour regression reliance being placed upon less toxic agents to maintain control (Bonadonna Monfardini de Lena and Fossati-Bellani 1969)

Some tumours appear to be dependent upon the non-essential amino acid asparagine and Broome (1961) revealed that the enzyme l asparaginase could act as an antimetabolite by depriving malignant leukaemic cells of asparagine which it breaks down to aspartic acid Mashburn and Wriston (1964) obtained asparaginase from *B coli* although it is only the EC 2 variety which is antimitotic Supplies are extremely limited and the enzyme is expensive to produce but it has the supreme advantage over all other agents in being non toxic to normal cells

MISCELLANEOUS AGENTS

A group of miscellaneous agents defy satisfactory categorisation They include metaphase arrestors like colchicine and podophyllin derivatives which act as spindle poisons preventing or disorganising spindle formation during the metaphase of the mitotic cycle (Stamm and Stahelin, 1965) Podophyllin derivatives unlike colchicine,

have little effect upon blood forming organs and are therefore valuable in the intra-arterial techniques Grewal Sumnal Sachdev and Rastogi (1967) reported favourably in their experience of fifty cases using SPI the ethylhydrazide and SPG the benzylidene compounds of the glucosides New glucoside derivatives are being investigated and Stahelin (1969) has reported the cytostatic activity of VM26

Other examples of miscellaneous compounds are urethane and hydroxyurea which inhibits the growth of rapidly dividing cells by preventing the reduction of ribonucleotides to deoxyribonucleotides (Krakoff Brown and Richard 1968) There are also methylhydrazines like natulan an agent of low toxicity useful in Hodgkin's disease (Bolling 1963) and experimental compounds like the metal chelates of copper and ruthenium (Dwyer Mayhew Roe and Shulman 1965) Mackay Coombes and Bjorklund (1966) claim to have isolated a cytolytic factor and Thornes and O'Meara (1961) described a coagulative factor responsible for the invasiveness of malignant cells inhibited by a protamine derivative prolothan.

COMBINED THERAPY

Chemical Agents — The effect of cytotoxic agents can frequently be enhanced by combining two or more different agents with complimentary actions *eg* an alkylating agent with an antimetabolite Constanzi and Coltman (1969) have recently claimed improved response and increased survival following combination therapy using cyclophosphamide vincristine methotrexate and 5-fluorouracil in the treatment of solid tumours and Fig 8 demonstrates how a patient with multiple metasta-

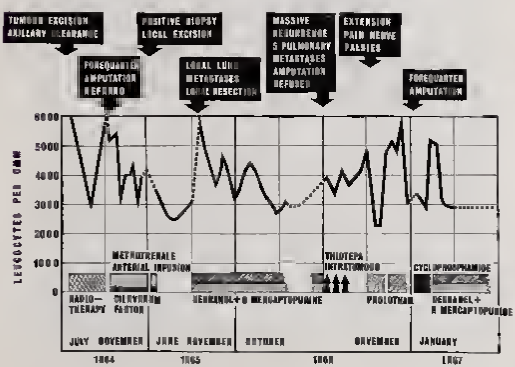


Fig 8 *Combined therapy in patient with multiple metastases from fibrosarcoma*

ses from a fibrosarcoma of the forearm who initially refused forequarter amputation could enjoy an active life of good quality with combination therapy.

By combining L-asparaginase with a glutamine antagonist Tarnowski, Monntain and Stock (1969) obtained an appreciable increase in survival in the survival time of animals with transplanted tumours. Creasey (1966) has shown that combinations of vinblastine and actinomycin D exhibit synergistic immour inhibitory activity in vivo if therapy for lymphomas and choriocarcinomas is satisfactorily maintained. Cohen and Carbone (1969) have claimed enhancement of the effect of the alkylating agent cyclophosphamide by vitamin A. Ross (1961) has suggested lowering the pH of malignant tissue by pre-treatment with glucose to cause increased accumulation of lactic acid as the result of glycolysis. This should enable neoplastic tissue to concentrate basic drugs like the aromatic nitrogen mustards with basic side chains. Finally, metaphase arrestors can be used to achieve mitotic synchrony, then with drawn to allow malignant cells to complete division and pass simultaneously into the early resting phase of the cycle during which they are thought to be most sensitive to alkylating agents. By combining a prolothan infusion with the appropriate antimetabolite we have obtained a response which we had failed to achieve when the alkylating agent was used alone.

The problem is, of course, that remissions do not last and it is often necessary to use, in the later stages, a variety of combinations of drugs known to have a synergistic effect. In this connection it is well to note the warning of Kondo (1964) that if a chemotherapeutic agent is relatively inefficient against an immour drug administration produces a reduction in host defence and in this way accelerates the tumour growth and the promotion of metastases. This is illustrated by one of our cases with widespread metastases from malignant melanoma who had been reasonably well controlled by melphalan and hormonal therapy until rapid extension occurred unexpectedly. Since this appeared to be due to a breakdown of host resistance we treated the patient with gamma globulin without however seeing noticeable improvement.

Radiotherapy — Then there is the question of radiotherapy and Fernbach and Martyn (1966) have shown that a 57 per cent mortality rate can be converted into a 92 per cent survival rate by a combination of actinomycin D, surgery and irradiation. Radiotherapy is superior to chemotherapy in the treatment of tumours of the bladder, uterus, cervix and solitary plasmacytoma, but chemotherapy is superior to radiotherapy for choriocarcinoma, tumours of the ovary, diffuse myelomatosis, melanomata, superficial basal cell tumours of the skin and the late effects of tumours of the stomach, colon, rectum, liver, bile ducts and pancreas. Radiotherapy combined with chemotherapy is valuable in Hodgkin's, Wilms', Ewing's, reticulum cell sarcoma, lymphosarcoma, seminoma, breast tumours and squamous tumours, radiotherapy being, on the whole, more effective in the earlier stages and chemotherapy more effective when metastases appear.

Hyperbaric oxygen — Cytotoxic drugs have also been used in association with hyperbaric oxygen therapy although Adams and Ledingham (1964) found no signi

ficant benefit using nitrogen mustard. However Hutcheock (1966) using intravenous 5-fluorouracil obtained a significantly better response when oxygen was added although there seemed to be little difference between oxygen at 1 ATA and 3 ATA in a small but important number of patients. We have found hyperbaric oxygen in-



Left: Malignant melanoma of left cheek with biopsy infected with



Right: Skin graft after treatment with Methotrexate and hyperbaric therapy

valuable in the occasional case A patient with generalised myelomatomasis developed extensive ulcerating soft tissue myelomatous infiltration of the chest wall following rib biopsy later complicated by pyocyaneus infection (Fig 9) However hyperbaric oxygen (2 hours at 2½ ATA twice daily) permitted successful split skin grafting (Fig 10) his melphalan therapy being continued

Surgery — An example of the use of combined therapy in a particularly stubborn surgical condition is the established superiority of intraperitoneal thioTepa associated with multiple or excisional procedures in pseudomyxomaperitonei (Long, Spratt and Dowling 1969)

Hormones Matthias (1968) uses a combination of chlorambucil actinomycin D and methotrexate in the treatment of testicular tumours and vincristine prednisolone and methylhydrazine in Hodgkin's disease A problem arises however when adrenalectomised patients with metastatic breast cancer require to be treated by cytotoxic therapy and there are conflicting reports Tipton (1964) needed to increase the steroid maintenance dose during 5 fluorouracil therapy but Saba Hall and Griffiths (1969) using cyclophosphamide mytomycin C or vincristine found this unnecessary Our own experience has been variable One patient developed sudden profound bone marrow depression following intra arterial methotrexate therapy for axillary recurrences whereas another patient required much more corticosteroid support during an intra arterial infusion of 5 fluorouracil for supraclavicular metastases than for a similar infusion using methotrexate The behaviour of adrenalectomised patients appears unpredictable These patients require careful monitoring and adjustment of their maintenance dose not only in terms of total daily dosage but also in relation to the gluco mineralo corticosteroid balance

The choice of agent — In attempts to avoid empiricism in treatment, the sensitivity of tumours to cytotoxic drugs has been assessed by in vitro and in vivo experiments Schmid Cappuccino Merker Tarnowski and Stock (1966) published the result of the selective action of cytotoxic drugs against a spectrum of animal tumours used by the Sloan Kettering Institute most nearly representing a cross section of human tumours They showed that cyclophosphamide purine analogues vinblastine and actinomycins had both immediate and delayed action upon carcinoma and osteogenic sarcoma and that cyclophosphamide and floxuridine were most effective against adenocarcinoma

INDICATIONS AND THERAPEUTIC TECHNIQUES

Chemotherapy can undoubtedly provide the patient with added protection at the initial operation and with prolonged remissions in the stage of widespread metastases Unfortunately most of the information at present available is published in the specialist journals of a number of different disciplines and the busy surgeon anxious to do his best for his patient finds himself confused by the conflicting advice he is frequently given It is therefore little wonder that a great deal of cytotoxic therapy is empirical ill advised and not always in the best interest of the patient For these reasons we have made it our practice at the Royal Naval Hospital Haslar

to define four clear indications for its use (1) prophylaxis (2) pre-ablative therapy (3) local and regional malignancy and (4) inoperable recurrent or metastatic disease

TABLE I

PROPHYLAXIS

(a) **Potentially Contaminated Operative Field**
Local irrigation 1 in 500 Perchloride of Mercury
0·5 per cent Sodium Hypochlorite

(b) **Circulating Malignant Cells Liberated at Operation**
Intermittent Intravenous Cyclophosphamide

(c) **Adjuvant in Surgery, Radiotherapy or Both**
Oral Intravenous or Intra arterial Therapy with Specific Agent

Prophylaxis Table I suggests an approach to the problem Smith Thomas and Hilberg [1958] demonstrated cancer cells in wound washings from 26 per cent of patients undergoing definitive cancer surgery and Morgan (1955) using 1 500 perchloride of mercury irrigations reduced suture line recurrences after restorative operations for carcinoma of the rectum from 21·4 to 2·09 per cent Freshly prepared 0·5 per cent sodium hypochlorite solution is safer and more effective Forrest (1961) and Sellwood Kuper Wallace and Burn [1965] isolated malignant cells from the peripheral blood during operation Cyclophosphamide a quick acting alkylating agent should be given in fractionated doses intravenously before during and for three days after the operation There is some difference of opinion concerning the dose We use 100 mgms before operation 100 mgms during the operation and 100 mgms on each of the three post operative days although other clinicians use considerably higher doses Actinomycin D is used before surgery and irradiation in the treatment of Wilms tumour

TABLE II

PRE-ABLATIVE THERAPY

Intra-arterial Injection or Perfusion
Mustine Cyclophosphamide SPI Methotrexate Melphalan Epodyl

Pre-ablative therapy Newton [1965] reported the results of arterial infusion during the last two weeks of a course of irradiation before operation for sarcoma of the limb and intra arterial injection of alkylating agents has been used successfully before pneumonectomy for lung cancer (Poulson 1962) and excision of the rectum (Salsbury McKinna Griffiths and Morgan 1965) Table II indicates the agents which are used SPI being the agent of choice at the present time in view of its low toxicity especially in regard to the blood forming organs [Westbury 1967] It is perhaps relevant to observe that there is much less enthusiasm now for intra-arterial melphalan prior to operations for melanoma of the limb Melphalan being a long-

acting agent must be delivered by an isolation perfusion technique and the agent removed on completion of the perfusion. Pratt, Betteridge and Dixon (1963) and Lentin and Nambier (1964) described techniques for regional cytotoxic perfusion before radical mastectomy but we have been loth to do this in cases of cancer of the breast because of the danger of depressing the patient's own immunological response at a time when it is most needed.

TABLE III

LOCAL AND REGIONAL MALIGNANCY

(a) Cytotoxic skin ointments
(b) Intra-arterial Infusion or Perfusion
(c) ? Lymphangiographic Techniques

Local and regional malignancy. Table III indicates the therapy available and malignancy confined to a single region of the body with a good blood supply is the indication *par excellence* for intra-arterial therapy in conjunction with surgery — either as a continuous low-concentration infusion or as a short duration high-concentration isolation-perfusion requiring temporary extra-corporeal circulation with pumps, heat exchanger and bubble oxygenator (Creech, Krementz, Ryan and Wimblad, 1958; Irvine, Noon and Bastable, 1962). Raising the temperature of the perfusate increases the speed of reaction and tourniquets, hypothermia and a perfusion pressure lower than the systemic blood pressure will protect the rest of the body and reduce leakage to the general circulation. This leakage can be monitored by dye dilution methods using Evans blue T-1824 or more accurately by ^{51}chromium-labelled red cells (Austen and Rakcr, 1960) and ^{131}I-labelled human serum albumin (Field, 1962).

Sites of cannulation are shown in Fig. 11: in the arm, through the radial, brachial and anterior circumflex humeral arteries into the axillary vessel; for the head and neck, through the superficial temporal or superior thyroid into the external carotid artery; for the breast, through the superior epigastric into the internal mammary artery or even via the radial into the subclavian. A good perfusion can be obtained by cannulating both. A suitable Seldinger catheter can be used for percutaneous selective angiography which we use for infusion of the lower limb and it is also used for the abdominal organs (Byron, Perez, Yonemoto, Bierman, Gildenborn and Kelly, 1961; Thomson and Foote, 1963). We have used 5-fluorouracil for liver perfusion with success, but the initial enthusiasm for floxuridine (Rochlin, Smart and Silva, 1965) which was thought to have fewer side effects is less evident. For the smaller cut down procedures we use a fine 93 centimetres epidural catheter.

Dyes can be used to determine the siting of the intra-arterial catheter. Engeset, Brennhovd and Stovner (1962) used patent blue violet and Tempest (1960) used disulphine blue. The disadvantage of intra-arterial dye injection is that the patient wakes up stained by the dye for up to 48 hours and this may carry unfortunate implications in the very ill patient. Dyes are very satisfactory in the head and neck where they show up well in the oral cavity and only a small quantity need be

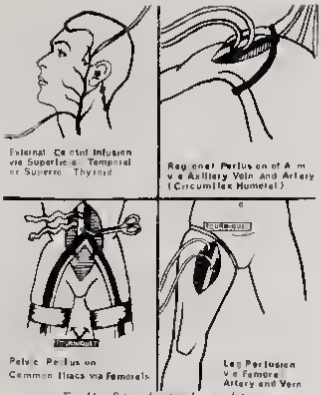


Fig 11 *Sites of intravenous cannulation.*



Fig 12 *Use of Fenwal pressure cuff over plastic bag in intra arterial infusion*

used, but we prefer 5 per cent fluorescein and examination of its regional distribution by ultraviolet light in other situations. Arteriography confirms siting of the catheter in abdominal perfusions.

Espiner, Vowles and Walker (1962) introduced a gravity method of arterial infusion with bottles held at 300 centimetres above the patient but we now use the Fenwal pressure cuff (Krant, Hall, Lloyd and Patterson, 1961) over a plastic bag containing the solution. This also reduces the danger of air embolism (Fig. 12).

In some clinics out patient arterial infusion is given by means of a small clockwork pump (Watkins, 1963; Barkin, Cowan, MacDonald and Mahoney, 1966) or screw advancement syringe (Rush, Das and Boone, 1966). In a collected series of various techniques of regional cytotoxic perfusion and infusion for malignant melanoma, head and neck cancer, and advanced abdominal cancer (Watt, 1968) it was shown that the average response to therapy was 50 to 60 per cent. Even without objective remission, relief of pain was often immediate.

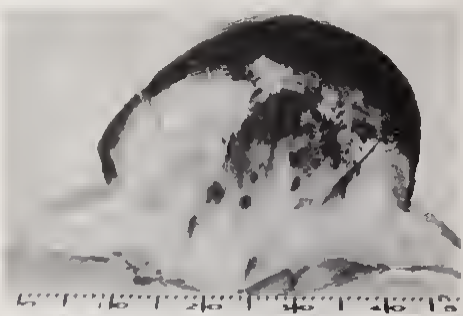


Fig. 13.—*Soft tissue osteogenic sarcoma of [illegible] old scar of patient with amputation of opposite leg.*

One of our patients had sustained multiple injuries in a road traffic accident 44 years previously resulting in the loss of the right leg above the knee. He developed a soft tissue osteogenic sarcoma in the scar of his remaining leg (Fig. 13) and was treated successfully by intra-arterial femoral infusion of methotrexate, wide excision and skin graft (Fig. 14).

Following the encouraging report by Gough, Gurney and Kinmonth (1963) that endolymphatic ^{198}Au as a method of delivering high local doses of radiation to regional glands, the possibility of chemotherapeutic agents by this route was apparent but has so far proved unreliable (Cox, Hare and Bruce, 1966) and diffusion of the agent occurs into tissues along the course of the lymphatics.



Fig. 14. One year after treatment of perforating recurrent ulcer and skin graft

Topical cytotoxins have been found effective against local skin cancers (Beltsario 1965) and we have had complete success with colchamine creams in the treatment of small superficial basal cell carcinomas of the skin

Inoperable, Recurrent and Metastatic Disease Table IV sets out the indications and therapeutic practice in the later stages of cancer. Skin metastases with their associated pruritis will often disappear with thioTepa, colchicum and prolothan creams. Fixed inoperable soft-tissue tumours occasionally respond dramatically to injections of thioTepa directly into the tumour and Lawton (1964) has used a jet injector to deliver thioTepa in this way. Generally such tumours are radio resistant but there is some evidence that the effects of radiotherapy can be enhanced by 5-fluorouracil (Foye, Willett, Hall and Roth 1960) and actinomycin D (Farber 1961). We have used repeated intra arterial subclavian infusions to disperse supraclavicular metastases from cancer of the breast in a patient distraught with pain and unable to sleep. The pain disappeared entirely within 48 hours never to return

(Fig 15) W[illegible] combination with freezing with local thioTepa injections [illegible] and Wiltshaw 1967) has reported very favourable results



Fig 15 [illegible]

TABLE IV

INOPERABLE RECURRENT AND METASTATIC DISEASE

(a)	**Skin Metastases**	Cytotoxic Ointments (ThioTepa) Coagulative Factor Inhibitors (Prolothan)
(b)	**Inoperable Soft Tissue Mass**	Intratumour Injection (ThioTepa) Intra arterial Infusion or Perfusion Radiotherapy with Potentiating Agent (Vincristine–Actinomycin D)
(c)	**Pleural and Peritoneal Metastases**	Intracavity Injections (TheoTepa)
(d)	**Widespread Dissemination**	Specific Agent Sequential Combined Therapy Agent Metaphase Arrestor Agent Coagulative Factor Inhibitor Agent Radiotherapy Agent – Hormonal Therapy Agent Hyperbaric Therapy (?)

in patients suffering from soft tissue sarcomata beyond the scope of surgery or radiotherapy who were treated with oral methotrexate in doses ranging from 2.5 to 10 mgm daily in courses lasting from 2 to 15 days We have used thioTepa to control malignant pleural effusions The pleural space is effectively obliterated by this treatment although Ariel Oropeza and Pack (1966) report that when the disease spreads to the opposite side deterioration can be rapid The effectiveness of intraperitoneal thioTepa in pseudomyxoma peritonei has already been mentioned and Cole Roberts Webb Strehl and Bates (1965) have pointed out that in experimental animals it is important not to wash out the alkylating agent after instilling it into

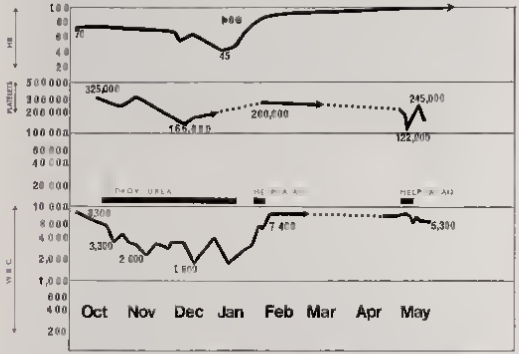


Fig 16 *Case of myelomatosis resistant to hydroxyurea (5 g) but marrow depression and responding to melphalan with rising haemoglobin and no significant white cell fall*

the peritoneum In our intraperitoneal injections we used to give 45 mgm thioTepa as the initial dose but this was subsequently reduced to 30 mgm following one rather alarming incident of temporary but profound bone marrow depression

An excellent example of the usefulness of chemotherapy in widespread malignant disease has been the success of melphalan therapy in the management of myelomatosis (Waldenstrom 1964) and Broad Emery Godlee and Prankerd (1968) have produced impressive figures showing the improved survival times which can be achieved with melphalan The results with melphalan are a significant improvement over results obtained when urethane was the treatment of choice We have found the regimen advised by Broad *et al* (1968) to be most successful and Fig 16 reveals that bone marrow depression is no index of the success of the treatment in this condition The patient in question was first treated by hydroxyurea and went rapidly down hill with profound anaemia leucopaenia and thrombocytopaenia Extension

of the bony metastases was widespread. Following melphalan treatment (0·15 mg/kg/day for one week every twelve weeks) his blood picture returned to normal he put on weight and the bony lesions recalcified.

Percutaneous selective cannulation of the coeliac axis has been used to perfuse inoperable growths of the pancreas and the liver but for the latter cannulation of the hepatic artery at operation is often more satisfactory. The pulmonary artery has been cannulated by means of a cardiac catheter to perfuse the lungs with cytotoxic drugs in cases of inoperable bronchogenic carcinoma and in this connexion de la Garza Carr and Bisel (1968) have reported reduction in the size of lung tumours by the use of the micronized form of the new oral alkylating agent hexamethylmelamine (HXM) in doses ranging from 8 to 12 mg/kg/day for 10 to 21 days.

The use of cytotoxic therapy has also extended to the treatment of meningeal metastases from carcinoma of the breast (McKelvey 1968) and recurrent posterior

TABLE V

Complications of cytotoxic treatment

1 GENERAL TOXIC EFFECTS	
(a)	**Bone Marrow Depression.** Granulocytopenia thrombocytopenia and anaemia
(b)	**Epithelial Necrosis** Skin vesication alopecia testicular atrophy buccal and gastro-intestinal exfoliation (Fig 17)
(c)	**Lowered Resistance to Infection** Bronchopneumonia, skin and wound sepsis
2 LOCAL EFFECTS	
	Vesication pigmentation and oedema tumour sloughing haemorrhage and sepsis muscle necrosis (uraemia) nerve damage
3 VASCULAR COMPLICATIONS OF INTRA-ARTERIAL TECHNIQUES	
	Arterial thrombosis and air embolism cerebral and gastro-intestinal haemorrhages post-perfusion peripheral circulatory collapse superficial and deep venous thrombosis catheter fracture leakage and dislodgement

fossa tumours (Wilson and Norrell 1969). In both cases methotrexate was used and McKelvey suggests that since the blood-brain barrier impedes the entrance of methotrexate into the central nervous system the intrathecal route should be used.

As will be seen from Table V cytotoxic drugs being general tissue poisons may produce serious complications and careful attention to dosage is desirable. A safe dosage schedule is set out in Table VI. Careful monitoring of the patient during the acute phases of therapy involves daily white cell and platelet counts. The more toxic drugs are often used to induce remissions after other drugs have failed and maintenance is maintained by safer cytotoxins the most widely used of which is cyclophosphamide. However it is important to emphasise that cytotoxic therapy must remain in the hands of consultants who understand its problems.



Fig. [illegible] Skin [illegible] of [illegible] inflammation of the arm



Fig. [illegible] Nevi [illegible] in [illegible] type [illegible]

TABLE VI

SOME CYTOTOXIC DRUG DOSAGES FOR ADULTS	
CYCLOPHOSPHAMIDE	Oral 100-300 mg daily indefinitely I V 100-200 mg daily to a maximum of 2-3 g Intraperitoneal 200-400 mg Intrapleural 600-800 mg
DEGRANOL (Mannomustine HCl)	50-100 mg alternate days to a maximum of 1 0g orally (also given parenterally)
MUSTINE HCl	0 1-0 2 mg/kg body weight for 3 or 4 days as slow I V infusion
METHOTREXATE	Intra arterial 30-45 mg per 24 hours for 5 days initially and I V thereafter according to white cell and platelet count
MELPHALAN	In malignant melanoma and myelomatosis Oral 0 15 mg/kg/day for 7 days every 12 weeks
MERCAPTOPURINE	50 mg tablets 50-150 mg alternate days with alkylating agent as combined maintenance therapy
NATULAN (Ibenzemethyzin)	Daily oral dosage of 50-400 mg to total of 7 10 g
THIO-TEPA	Local and intraperitoneal injection 30-45 mg at weekly intervals according to w b c. Mix with 2 per cent Procaine HCl or Epinephrine HCl 1 1000 when injecting into tumour
PROLOTHAN G	Slow I V drip 20 mls daily in 5 per cent dextrose solution
VINBLASTINE	At weekly intervals First dose 0 10 mg/kg increasing by 0 05 mg/kg to leucopaenia producing dose Maintenance dose 0 15-0 20 mg/kg
EPODYL	Single intra-arterial or intravenous infusion of 100-250 mg/kg
URACIL MUSTARD	1-2 mg daily orally until remission or toxicity for 3 of every 4 weeks
5-FLUOROURACIL	15 mg/kg body weight diluted in 500 mls dextrose saline I V per day for 4 days Reduce to 7 5 mg/kg on 6th 8th 10th and 12th days 4 6 week intervals between courses

N[illegible] l[illegible] lusage sched[illegible]les are merely a reasonably safe guide and do not necessarily repre[illegible] [illegible] or maximum regimens Current literature must always b[illegible] consulted before [illegible] [illegible]ic therapy

throughout the entire length of treatment The initial therapy and all therapy requiring cannulation should be carried out in hospitals with facilities to treat complications

Prolonged remissions have often been achieved at the expense of profound bone marrow depression requiring expensive forms of patient isolation. The most sophisticated and efficient unit is to be found in the Princess Chula Ward at the Royal Marsden Hospital where reversed barrier nursing is carried out (James Jameson Kay Lynch and Ngan 1967) This is quite beyond the resources of most hospitals and since the Royal Navy from time to time has a requirement to isolate patients for a variety of reasons attempts have been made to develop a cheap disposable isolator which can be readily dismantled stored and re assembled This has its own sterile air supply and Fig 18 is a photograph of the prototype.

SUMMARY

The structure action and specificity of cytotoxic drugs have been described Some indications for cytotoxic therapy have been suggested and useful guidelines for therapy have been indicated Some special techniques have been outlined and and the complications have been reviewed Monitoring and isolation facilities have been described

Since Rhazes (850 932 AD) introduced the clinician to chemistry it is fitting that he should have the last word The knife should never be used except when the disease is limited and the whole tumour can be completely removed

ACKNOWLEDGMENTS

I wish to record my indebtedness to Mrs J Reynolds for secretarial assistance Mr J Williams for the photographs and M T J J Richards for the illustrations My grateful thanks are also due to the Editor of the *Journal of Bone and Joint Surgery* for permission to quote extracts from my article The Use of Cytotoxic Drugs in the Surgery of Malignant Disease appearing in the August 1968 issue Vol 50 B No 3 and for permission to use Fig 8 The present article is a revised and expanded version

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GINGIVAL HEALTH IN POLARIS AND CONVENTIONAL SUBMARINES

By M. N. Naylor, G. D. Sharpe and C. T. Staley

Introduction

It has been suggested that environmental factors curious to nuclear submarines undergoing long periods under water have an adverse effect upon the gingival tissues of the Ship's Company. Of these the raised CO_2 tension in the inspired air has caused concern, but in addition the possibility of a deterioration in standards of oral hygiene associated with long-term submergence must be considered.

In order to establish the existence or otherwise of such a problem amongst Polaris submariners a gingival assessment was made of the Ship's Company of HMS *Resolution* and compared with a similar assessment of the Ship's Companies of HMS *Triptoe* and HMS *Olympus*.

Method

The examinations in *Resolution* were carried out during the passage of the submarine up the Firth of Clyde to her base on completion of eight weeks on patrol, four hours after surfacing. The examinations in *Triptoe* and *Olympus* were conducted during short passages in home waters.

Examinations were carried out by two of us (MNN and CTS) using illumination from an anglepoise lamp. Woodeu spatulae were used as retractors and assessment was made on visual examination only. In *Resolution* an appropriate random selection of approximately 25 per cent of the Ship's Company was made previous to our arrival on board by the medical officer, an attempt being made to stratify according to age and the part of ship in which the men worked. In *Triptoe* and *Olympus* all members of the Ship's Company were examined by CTS only.

Data were recorded on a specially prepared form and included details concerning missing teeth, whether or not gums bled, the frequency and whether there were calculus deposits present together with the site and extent, and oral hygiene. The gingivitis score was recorded using a method essentially similar to that described by Löe and Silness (1963). The criteria for scoring were as follows:

0 Absence of inflammation

1 Mild inflammation
- slight change in colour
- little change in texture

2 Moderate inflammation
- moderate glazing, redness
- Oedema and hyperplasia

3 Severe inflammation
- marked redness and hyperplasia
- tendency to spontaneous bleeding
- ulceration

Visual assessments were made and scores given to the distal and mesial papillae and the buccal margins of the upper right first molar, the upper right second incisor, the upper left first premolar, the lower right first premolar, the lower left second incisor and the lower left first molar. Thus there was a total of 18 units. If one or more of the specified teeth were missing, no score was given for any of the three units associated with that tooth. In the absence of an adjacent tooth, no score was ascribed to the common interdental papilla.

In order to ensure uniformity of assessment, CTS was calibrated against MNN who had had previous experience in using the method.

The gingivitis index was calculated by dividing the sum of the scores for the units assessed divided by the number of units. The index varied from 0-3.

Results

As Table 1 shows, 34 subjects were examined from HMS *Resolution* (Polaris Crew) and 103 from HMS *Tiptoe* and HMS *Olympus* combined (Conventional Crews). The table also shows that the mean age of the Polaris crew was 27·6 years and the conventional crews was 24·0.

TABLE 1
Number of Subjects and Mean Ages and S.D.

Polaris Crew		Conventional Crews	
No. of Subjects	Mean Age	No. of Subjects	Mean Age
34	27·6±6·09	103	24·0±4·9

The mean gingival indexes are given in Table 2, which shows that for Polaris crews it was 0·64 and for conventional crews 0·61. In Tables 3, 4 and 5 the Gingival Index has been broken down into sub-groups *ie* 0-0·49, 0·50-0·99 and 1·00 and above, Table 3 giving the distribution of subjects within each sub-group.

TABLE 2
Mean Gingival Index and S.D.

Polaris Crew	Conventional Crews
0·64±0·40	0·61±0·38

TABLE 3
Distribution of Subjects within Gingival Index Sub-Groups

Gingival Index Sub-Group	Polaris Crew	Conventional Crews
0·0-0·49	11 (32·3%)	45 (43·7%)
0·50-0·99	13 (38·2%)	40 (38·8%)
1·00 & above	10 (29·5%)	18 (17·5%)

TABLE 4
Bleeding of Gums

Gingival Index Sub-Group	Polaris Crew	Conventional Crews
0-0 49	2	8
0 50-0 99	1	19
1 00 & above	3	8

In table 4 the number of subjects who gave a history of bleeding gums and the distribution within the sub-groups is given of the Polaris crew 14 subjects (41 2 per cent) reported a history of bleeding gums but only four admitted that bleeding occurred often In the conventional crews 35 (33 9 per cent) reported bleeding gums but only two described the occurrence as often

Table 5 gives the distribution of calculus and it will be seen that amongst Polaris crew 18 (52 9 per cent) subjects were found to have readily detectable calculus in the lingual surfaces of the lower anteriors and/or the buccal surfaces of the upper first molars All but five of these had deposits described as mild the remainder being moderate In the conventional crews 59 subjects (56 7 per cent) had calculus in 53 the deposits were described as mild the remainder being moderate

TABLE 5
Presence of Calculus

Gingival Index Sub-Group	Polaris Crew	Conventional Crews
0-0 49	5	17
0 50-0 99	7	30
1 00 & above	6	12

Table 6 gives the oral hygiene gradings Amongst the Polaris crew 26 were graded as good and eight as indifferent in the conventional crews 90 were good 12 indifferent and only one bad

TABLE 6
Oral Hygiene Gradings

Gradings	Polaris Crew	Conventional Crews
Good	26	90
Indifferent	8	17
Bad		1

Discussion

The design of this study might be criticised on the grounds that the examination of the Polaris crew did not include the whole of the Ship's Company and that the sample may not have been truly representative The circumstances of the study however precluded complete examination but an attempt was made to provide a random sample care being taken not to rely upon volunteers

A further criticism is that different examiners assessed the Polaris and conventional crews To ensure uniformity considerable time was spent before the examinations with the two examiners practising together Calibration of CTS against MNN showed such a consistently high degree of agreement that it was felt that different examiners were justified

Any partial recording system is open to criticism but available evidence indicates that the six areas selected are likely to give a representative picture of the health of the gingivae The effect of any local irritant such as an appliance or a poorly finished filling would of course not be included in the score unless it involved the areas examined Without exception the conservation was of an extremely high standard and there was no evidence that denture wearers showed any unusual adverse tissue changes

The index used in the study is an extremely sensitive method of detecting gingival inflammation but it does not take into account the presence of periodontitis with its associated pocketing An index including such criteria would require the use of an instrument to measure pocket-depth and in the time available this was impracticable However since gingivitis is always present with periodontitis the omission of a pocket measuring technique was regarded as justified

It is important to note that the mean gingival indexes for the Polaris and conventional crews are of similar order and below unity This provides clear indication not only of the similarity between the two crews but also that the prevalence of disease is generally low amongst both Polaris and conventional submariners

The distribution of subjects within the sub groups (table 3) shows that compared with the conventional crews a greater percentage of the Polaris crew had an index above 1 00 and lower percentage below 0 49 Although the explanation for this is not clear a possible reason is the higher average age of the Polaris sample

The percentage of subjects giving a history of bleeding gums was slightly higher in the Polaris crew than in the conventional crews However a history of bleeding gums is not regarded as of importance in the subjects examined as most reported occasional bleeding and those who reported bleeding as often showed no evidence of severe gingival disease Such bleeding as was found probably occurred as a result of over enthusiastic use and perhaps misuse of the toothbrush

The percentage of subjects with calculus was similar in both crews and in the majority of instances the deposits were described as mild In no subject was it considered severe The high prevalence of calculus does underline the need for regular scaling and the importance of the role of the dental hygienist

The high standard of oral hygiene in the subjects examined was generally most gratifying and there can be little doubt that this is the reason why the prevalence of gingivitis as indicated by the Gingival Index is low There is however room for further improvement, especially in the less accessible areas particularly the lingual surfaces of the lower incisor teeth Efficient brushing of these surfaces would reduce considerably the calculus deposits on these teeth

Conclusions

This study shows that amongst Polaris and conventional submariners there is a similar low prevalence of gingival inflammation. The findings revealed no special problems relating to periodontal health arising from service in Polaris submarines undergoing long-term patrols.

ACKNOWLEDGMENTS

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CARIES EXPERIENCE OF FIFTEEN YEAR OLD RECRUITS JOINING THE ROYAL NAVY AT HMS GANGES

By L. C. Langan

This study was carried out during the period August 1968 to March 1969 on boys entering the Royal Navy at HMS *Ganges*. All these boys were between the ages of 15 15½ years. The purpose of the survey was to find out if there was any variation in the number of decayed, missing and filled teeth with the area of previous habitation. Also to see if those coming from areas with a substantial amount of fluoride in the drinking water had less decay than the others.

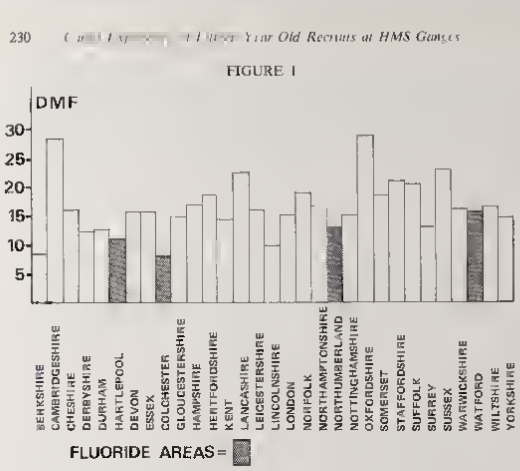
Methods

The patients examined amounted to approximately half the intake at *Ganges* during the period mentioned and totalled 354. All boys were examined by the writer under identical conditions in a dental chair with mirror and probe. The DMF index (Klein *et al* 1938) for decayed, missing and filled teeth was used to measure total caries experience. The home address was taken from their records. The children of Servicemen were not included in the survey because of the likelihood that they had changed address several times in their lifetime. The home areas were divided into fluoride areas and non fluoride areas. The latter was taken to be any area with 0·4 ppm or less fluoride in the water and any area with more than 0·4 ppm was taken to be a fluoride area. Scotland and Ireland were excluded from the comparison of areas as I could not obtain figures for the fluoride content of the water in these countries. The average figures for the fluoride areas were only used when I had at least three separate values for one area. The average figure for each county was used only when I had at least four values for that county.

Results

The mean DMF values for the counties in England and for the fluoride areas is shown in Fig. 1. Values not shown on that graph are Wales 2·5, Scotland 21·7 and Ireland 21·7.

FIGURE 1



The mean DMF for all patients was 17.2. The mean DMF in non-fluoride areas was 17.33 and for fluoride areas was 14.6.

FIGURE 2

MEAN DMF VALUES

Mean DMF All Boys	17.2
Mean DMF Non fluoride Areas	17.3
Mean DMF Fluoride Areas	14.6

Discussion

The average DMF of 17.2 for all patients seems very high for their age of 15 years when compared with values obtained by other workers using the same method of measurement. A value of 11 DMF teeth for 15-19 year olds was found by Sheiham and Hobdell in 1968 in a survey conducted on the civilian populations of London and Warrington. A value of only one is given for 15 year old boys in York a non fluoride area, by Murray (1969). It would thus seem that the boys entering the Navy at *Ganges* have a higher caries experience than average for their age. If we say the national average is ten then the *Ganges* boys are 70 per cent above this figure.

Comparison of the county figures shows Oxford and Cumbridge to be the worst and Berkshire to be the best. The averages for Scotland, Ireland and Wales are considerably higher than for England. The latter may be due to the greater number of patients per dentist in these countries when compared with England. The fluoride areas in Fig. 1 stand out clearly as having lower than average DMF values.

Comparison of Fluoride and Non-fluoride Areas

The mean DMF values for fluoride and non fluoride areas as given in Fig. 2 clearly show that those boys from fluoride areas had less caries experience than the rest. Those boys from fluoride areas had 15½ per cent less decayed, missing and filled teeth than those from the non fluoride areas. This figure seems statistically significant and provides further proof of the value of fluoride in drinking water.

ACKNOWLEDGMENTS

I would like to thank K. B. D. Stocker, LDS, RCS for supplying me with the fluoride concentrations in the drinking water of the counties of England and Wales.

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PSYCHIATRIC PROBLEMS OF PERSONNEL SERVING IN SMALL SHIPS IN THE PERSIAN GULF*

By L. G. Mealey

Summary

This paper presents data concerning psychiatric problems that occurred in small ships on the Persian Gulf/Middle East stations during the period November 1965 to November 1966 together with a brief survey of the environment.

Introduction

Psychiatric problems have been long recognised in the Navy during the time of the Napoleonic Wars there were psychotic wards in both Haslar and Plymouth hospitals. Two forms of illness were then recognised Insanity and Alcoholism. The two hospitals were and still are close to the sea and until they could be landed the patients were in the care of ships' surgeons. Nowadays of course things are arranged differently, we categorise Insanity into different types and recognise neurotic disabilities. There are psychiatric specialists ranged round the world but it is still the ship's doctor who has to deal with the cases in the first instance. This paper is based in the experiences of the author who was a general medical officer looking after a wide variety of small ships stationed in a part of the world which is well-known for its punishing climate.

The Environment

The ships nowadays are air conditioned which makes the climate which can reach temperatures of 125°F and humidity of 80 per cent in the summer months bearable. Most men have bunks and the living conditions although cramped are not unpleasant. The Navy has always prided itself on the standard of food in this post Nelson age and though complaints do occur they are never serious. Recreation is a serious business in a ship and a great deal of spare time is devoted to planning quizzes concert parties PT broadcasting and the invaluable ship's newspaper.

Much has been said of naval discipline stressing the stern measures which greet the offenders. This alone of course is relatively meaningless unless encouragement fairness and confidence are gained as a result of good behaviour. A large part of man management is the Divisional System. This consists of the ship's company being broken down into divisions dependent upon their trade and part of ship in which they work. Each division contains senior as well as junior rates and is supervised by an officer who is responsible for the welfare of the men in his division. The officer receives one month's training to equip him for this task. Therefore problems that arise on the mess deck are often dealt with speedily by the divisional officer.

*A paper read at the 4th Anglo American Symposium on Military Psychiatry at RAF Wroughton April 1969.

Sea-going ships on foreign commission often exhibit a higher incidence of mental psychiatric problems at the beginning and the end of the time away from home. This is sometimes called the 'end effects'. This was shown by Savin (1963)

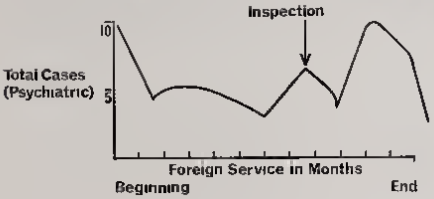


Fig 1 (*After Savin* 1963)

Experience in the Persian Gulf proved this point and medical officers were mainly employed in ships on their arrival and departure from the station.

As can be seen from Fig. 1 an inspection produced stress giving manifest to minor psychiatric cases. Many other factors are of course important. Particular 'danger' situations are those due to a ship being out of routine usually due to mechanical breakdown. Here part of the ship's company will be over working while their companions grow tired of the attractions of a foreign port. Poor communications with the outside world caused by long periods at sea such as the Beira patrol caused anxiety states which remitted when the ship received its mail.

There are extra problems that the sailor is asked to cope with and which sometimes overwhelm him when it occurs against the background of limited living space, noisy mess decks and irregular hours.

These stress factors do not however produce an increase in psychiatric cases or disciplinary problems as tolerance to stress is directly linked with the state of morale. It is interesting to compare two ships of similar task and complement that were subject to extra stress.

Ship 'A' suffered a mechanical breakdown and was incapacitated in a foreign port for six weeks. During this time there were seven psychiatric cases and an increase in disciplinary offences.

Ship 'B' was incapacitated in a foreign port due to sickness and mechanical failure for about six weeks. Added to its problems was infrequent mail and delayed repatriation of 30 per cent of the ship's company who had finished their draft. During this time there was only one mild anxiety state (which responded well to simple reassurance).

The only significant difference between the two ships was the state of morale which is dependent of course upon good leadership and communication stemming from the Commanding Officer through his wardroom and senior rates to the ship's company.

The Cases

The men in the sea-going population during this period numbered some two thousand serving in a variety of ships from minesweepers to modern frigates their ages ranged from 16 to 53 years Men with a previous history of psychiatric disorder are not allowed to serve in the Persian Gulf and therefore this sample is drawn who were as far as it was known mentally fit at the start of the commission

Number of Cases

Psychiatric Diagnosis	Referred to area Psychiatrists	Returned to duty by area Psychiatrists	Sent back to Netley U K	Returned to duty from Netley	Invalided
Personality disorders including Alcoholism	7	2	5	2	3*
Neuroses	5	2	3	2	1
Psychoses	3	—	3	1	2
TOTALS	15	4	11	5	6

Incidence of Psychiatric Cases 0·75%

FIG II

*Thus patients were two personality disorders and one alcoholic whose boarding diagnosis was a neurotic one in order to satisfy the then existing regulations

Referrals to Area Psychiatrists

Diagnosis	Number	% of Total	Expected % of Total
Personality disorder including Alcoholism	7	62 %	75%
Neurosis	5	33%	23%
Psychosis	3	5%	2%

FIG III

It is not possible to give an accurate figure for the total number of all psychiatric cases seen in ships by or owing to, the fact that only incomplete records were available However my own records show that for every two cases referred to the area psychiatrists, five were dealt with by the ship and its supportive welfare organisation

Communications with other doctors who served in this station during the period under review and scrutiny of ships Medical Journals indicate a similar result

The sort of case that was dealt with by the ship is the acute anxiety state, social problems which caused behavioural and psychological maladjustment and a few cases of tropical fatigue (Ellis–1960) which presented with psychological and motor retardation in a ship with poor air conditioning

Discussion

The apparent low numbers of personality disorder and high number of neurosis and psychosis patients compared with that expected in a similar sample (see Fig III) may be due to the effect of the Service continuing the vulnerable personality, as Plaze and Arthur (1965) have put forward by providing a secure environment with clearly defined discipline. Thus they would have the effect of artificially raising the figures for psychotic and neurotic patients expressed as a percentage of total psychiatric referrals. This is borne out by the incidence of psychosis (one of which was a psychotic depression who improved sufficiently with treatment to be returned to duty), agreeing with the figures found by Arthur (1965) for the US Navy in peacetime.

It is interesting to note that the area psychiatrist who for most of the time was based at RAF Steamer Point, Aden, *caseload* 73 per cent of all cases referred by seagoing ships. This may well be due to recognition of the fact that a psychiatric case referred from a ship is indicative that the resources of the medical officer executive officers and supportive welfare have failed. Certainly an inability to recognise this fact can create problems (Measey 1967 and Wallis 1968). The executive require a firm report and clear recommendations to prevent their dismay. The psychiatrist must increase the Service's trust in what he can do. At the moment he is looked on somewhat suspiciously' (Greenlees 1968).

The effect of extra stress is well known and graphically illustrated by Savin (1963). He concluded that morale and psychiatric disorder were directly linked. Certainly experience in the Gulf bears this out and the reverse is true in that ships with high morale could withstand extra stress without any rise in psychiatric problems.

The 'and effects' are of practical interest. The first peak appears to be associated with leaving home with unresolved domestic problems, the initial difficulty in achieving good interpersonal relationships and the anticipation of a long period of separation. The final peak appears to be anticipation of going home which is often associated with loss of interest in routine work, less pressure from the executive with resultant lowering of morale.

A potent source of stress is separation and poor communication with home. This is partially inevitable in a small ship but to some extent the problem may diminish as Naval wives meet in clubs and community centres which are being developed on Naval housing estates. It is hoped that there will be better liaison between ship and families which will provide a sense of security and identification for Naval wives which in turn will be reassuring for their seafaring spouses. It would, of course, be a distinct advantage if the community organisation was such that it could not before problems approached disaster level.

Conclusion

Seagoing personnel are subject to stress and extra stress often causes an increase in psychiatric problems. During one year in the Persian Gulf/Middle East stations the ship's medical and executive officers dealt with the bulk of these prob-

lems, referring 15 cases which had failed to respond to the area psychiatrists who *casevac'd* 11 of them (73 per cent)

A brief account of the commoner stress factors has been presented which may be of assistance in evaluating the sailor afloat when he is referred for specialist opinion

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I would like to thank Surgeon Captain A C Hunter RN (Adviser to Medical Director General (Naval) in Psychiatry) for all his help and encouragement in the preparation of this paper

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BILHARZIASIS IN MAURITIUS — A REVIEW

By Robert J Morrow

The 26 cases of bilharziasis previously reported (Morrow 1968) were instructed to report for follow-up during the months of March and April 1969 ie 30 months from inception of the original programme Arrangements were made for their admission collection of 16 hour urine specimens and cystoscopy under general anaesthesia Twelve cases reported

All 12 cases had remained symptom free since previous admission and showed no abnormal clinical findings Two cases admitted to continuance of bathing in local rivers and it is noteworthy from the table that these same two were the only cases showing viable ova of schistosoma haematobium in the urine Eight cases however showed evidence of past bilharziasis on cystoscopy as evidenced by the presence of nodules but no other bladder lesions were seen

Comparisons of Actiological Clinical and Cystoscopic features

Case No	Age	Sex	Haematuria	Other Symptoms	Washing in Rivers	S Ova in Urine	Cystoscopy findings
1	41	M					
2	19	F	—	—	—	—	—
3	31	M	No	Nil	No	N I	Nodules
4	18	M	No	Nil	No	N I	Nodules
5	46	M	—				
6	10	M	No	Nil	No	N I	Nil
7	12	F					
8	15	M			—		—
9	27	M	No	N I	No	N I	Nodules
10	13	M					—
11	13	M	No	N+I	Yes	86	Nodules
12	19	M	No	N I	Yes	110	Nil
13	18	M	No	N I	No	Nil	Nodules
14	42	F				—	—
15	11	F					
16	74	M				—	
17	7	F	No	N I	No	N I	Nil
18	60	F	No	N I	No	Nil	Nodules
19	39	M					—
20	12	M					—
21	21	M					
22	28	M					
23	17	M					
24	24	M	No	Nil	No	N I	Nodules
25	19	F	No	Nil	No	Nil	Nil
26	21	F	No	Nil	No	N I	Nodules

Conclusion

The 12 cases reported on received their initial therapy between 21 and 30 months prior to the review There was no evidence of clinical relapse in the series with the exception of the two cases who had continued to bathe regularly in rivers and who were found to have ova of schistosomiasis in the urine It is presumed these were cases of reinfection

Accordingly Ambilhar would appear to be an effective treatment against vesical bilharziasis

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CALCIUM, MAGNESIUM AND PHOSPHATE METABOLISM DURING PROLONGED EXPOSURE TO CARBON DIOXIDE

By S P Gray, R J W Lambert and J E Marris

SUMMARY

The daily urinary excretion of calcium magnesium and phosphate was determined in 12 healthy volunteers during a period of 22 days exposure to an atmosphere containing 1 per cent CO_2 Serum calcium fell significantly during the period whilst the urinary excretion of calcium fell during the first week and then rose again subsequently The serum magnesium remained remarkably constant and the urinary magnesium exhibited a very similar initial pattern to calcium but did not rise again to the same extent The serum inorganic phosphate did not change significantly but the urinary output of phosphate fell progressively over the whole period of exposure A relationship is shown between the serum calcium within the normal range, and the urinary calcium (per unit Glomerular filtration rate (GFR)) which indicates that the kidneys play a larger part in calcium homeostasis than hitherto suspected

INTRODUCTION

Experimental animals exposed to 1 5 per cent CO_2 for long periods develop calcification of the kidney (Schaefer and Niemoller 1960) and it has been argued that this condition may apply to personnel subjected to increased CO_2 tension for prolonged periods in submarines The aetiological factors involved in calcification and renal stone formation are many and diverse such as renal tubular acidosis hyperparathyroidism or anatomical abnormalities in the urinary tract Albright *et al* (1953) suggested that a high urinary calcium was a factor in renal stone formation, but Hodgkinson and Pyrah (1958) found many symptomless hypercalciuric individuals in a normal population Other urinary constituents have been implicated by some workers Modlin (1967) suggested that a high Na/Ca ratio protected against calcium precipitation but Papadimitriou *et al* (1968) examined the urinary electrolytes in a group of stone formers and a group of controls and concluded that there were no significant differences in the Na Ca ratio Evans *et al* (1967) found urinary magnesium to be significantly lowered in some of their normocalciuric stone formers The role of magnesium was felt by Oreopoulos *et al* (1968) to be important in the process of stone formation particularly if the ratio Mg/Ca was low Isaacson (1968) concluded that there was no evidence for unique abnormalities in Na or Mg excretion in nephrolithiasis and that although hypercalciuria relative to Na, K, Mg osmolality and ionic strength was a feature of stone formers the most consistent finding was hypercalciuria relative to osmolality

The formation of calcium salts in an insoluble state is evidently a multifactorial process and the investigation of a single aetiological factor is unlikely to be productive In our own series however (unpublished) stone formers did exhibit some very low urinary magnesium values which were well below the commonly accepted values In the present study a group of healthy individuals were examined to see if any metabolic

effects arose from breathing 1 per cent CO_2 for a period of three weeks which might alter the renal output of Ca Mg and P these being some of the factors which may be relevant to renal stone formation

MATERIALS AND METHODS

Volunteers for this study were twelve healthy members of a submarine crew Their ages ranged between 20 and 35 years and none had any history of renal or skeletal disease All were subjected to an atmosphere of normal air containing 1 per cent CO_2 The composition of the atmosphere was monitored 4-hourly with an installed infra-red atmosphere analyser A minimum of three readings was taken on each occasion from different parts of the vessel Diet was free both before and during the experimental period the only difference being in the use of distilled water instead of tap water and the use of a milk substitute for beverages The tap water normally taken had a Ca concentration of only 30 ppm and the milk substitute differed only slightly from milk Calcium and magnesium intake was thus similar before and during the experiment

The period of exposure to this environment was twenty two days with brief periods of surfacing when the mean concentration of CO_2 fell to not less than 0 5 per cent Fasting blood for calcium magnesium phosphorus and creatinine were collected on the second ninth and seventeenth days of the experiment Aliquots of the first morning specimen of urine were collected on the day before and every day of the investigation All sera and urine were frozen at −20 C within minutes of collection

Analyses for calcium and magnesium were made on a Pye Unicam SP90 atomic absorption spectrophotometer using the method supplied by the manufacturer Creatinine and phosphate analyses were carried out on the Auto Analyser (Technicon) also using standard methods The concentrations of Ca Mg and P were expressed as mg/100 ml of glomerular filtrate (GF) using the equation (*eg* calcium)

$$\text{Calcium excretion } (mg/100 \text{ ml GF}) \quad C_{Ca} = \frac{{}^{U}Ca \times {}^{P}Cr}{{}^{U}Cr}$$

Where ${}^{U}Ca$ urinary calcium in mg/100 ml
${}^{P}Cr$ Plasma creatinine in mg 100 ml
(Peacock and Nordin 1968)

Statistical methods used were those from Documenta Geigy Scientific Tables (6th Edn)

RESULTS

The atmospheric CO_2 level throughout the period of study was 1 02 (SD 0 19) except for three brief periods when the CO_2 concentration fell to a lowest mean value of 0 53 per cent

The daily mean urinary excretions of calcium, magnesium and phosphorus are shown plotted in Fig 1 as mg/100 ml GF, versus the time of exposure to CO_2 The calculated ratio of Ca/Mg for each day is also shown in Fig 1

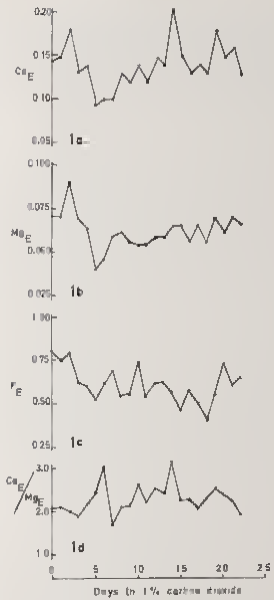


Fig. 1

Serum	Ca	Mg	P
day 2	10.2	1.89	3.43
day 9	9.9	2.00	3.48
day 17	9.7	1.98	3.46

TABLE I

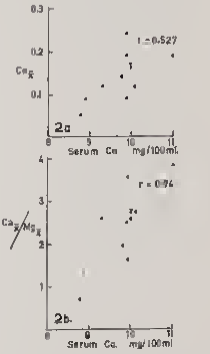


Fig. 2

Table I gives the mean values of the 12 subjects for serum calcium magnesium and phosphorus

The relationships between the serum and urine levels of calcium and magnesium are illustrated in Fig 2

It can be seen from Fig 1a that Ca_E rises steeply up to the second day and then falls sharply to the fifth day Marked fluctuations are seen until the end of the period of study The net change in mean values, however is small and negative, the cumulative

sum of the differences from the initial value before exposure being nearly zero A similar pattern is shown by magnesium Fig 1a the correlation between these two being significant ($P < 0.01$) but it is evident from Fig 1b that Mg_E remains lower than initial level over the period of exposure Phosphate shows the same initial pattern as the other two elements up to the eighth day but after this no real similarity in behaviour is noticeable No significant correlation was demonstrable between P_E and Mg_E Ca_E Phosphate excretion is diminished to a greater extent than the other two and the cyclic pattern was unrelated to the fluctuations in CO_2 concentration as indeed were both Mg_E and Ca_E

The ratio of Ca/Mg is seen to rise (Fig 1d), this rise being largely due to lowered Mg_E rather than raised Ca_E

If the whole mean Ca_E (Ca_E) from a given individual for the twenty two days of test is plotted versus the serum values from the 17th day of the investigation then the scatter graph in Fig 2a results A distinct trend is seen which is significant ($P < 0.05$) When Ca_E/Mg_E is plotted versus the serum calcium values (Fig 2b) a much better relationship is seen which is highly significant ($P < 0.01$) The mean serum calcium is seen to fall, (Table 1) and this fall is significant ($P < 0.05$) The serum inorganic phosphate and magnesium do not show any change in mean value

DISCUSSION

The major environmental difference experienced in this study was the relatively high level of carbon dioxide compared to normal air Diet was free both ashore and afloat and did not appear to be measurably different A diminution of urinary volume of up to 20 per cent has been recorded by Schaefer and Niemoller (1960) and confirmed by our own observations (unpublished) and this may play a significant part in the kinetics of mineral handling by the kidney

Acclimatisation to CO_2 and its effects on Ca and P metabolism was examined by Schaefer *et al* (1963) who concluded that their results were compatible with storage of Ca and CO_2 in bone as a release of both these was seen on de acclimatisation

In the present study the increase in Ca_E and Mg_E seen within two days may be regarded as a rapid physiological response to the environment Factors such as changed absorption and hydration would not be expected to act so quickly The steep fall after the second day may be compatible with storage but the subsequent fluctuations are difficult to explain The common renal handling mechanism of Ca and Mg is seen in figure 1a and 1b and the relationship is significant ($P < 0.01$) (Hanna *et al* 1961) The similarity is not complete however as Mg_E is lowered relatively more than is Ca_E so that an increase in the Ca_E/Mg_E ratio results The significance of this finding may be related to the finding of a lowered urinary magnesium in stone formers compared to controls (Evans *et al* 1967) Our own findings (unpublished) show a small but significant ($P < 0.05$) difference in the 24-hour magnesium output between these groups The difference would not appear to be of physico chemical importance in urolithiasis on its own, but it may well be a factor in the process The constancy of the serum magnesium exhibited in the study (Table 1) seems to reflect the ability of the nephron to maintain a remarkable homeostasis for this ion in the blood

(Steele *et al*, 1968). The serum calcium on the other hand drops to a small but significant extent ($P<0.05$) over a period of exposure, a finding which confirms the results of Schaefer *et al* (1963).

The fall in P_E differs from that of Ca and Mg in that it is sustained much longer. In acute respiratory acidosis, a transient phosphaturia is often seen (Barker *et al* 1957) but information about the behaviour of phosphate in prolonged hypercapnia is not available. The hydrogen ion output in urine would be expected to increase as a response to breathing carbon dioxide, with particular increase in ions such as $H_2PO_4^-$. The diminution in P_E may be explicable in terms of an increased excretion of H^+ as NH_4^+ rather than as secondary phosphate. Further work is being carried out to elucidate this point. The serum level of inorganic phosphate did not change (Table 1) so that if the P_E is an estimate of output, then the absorption or storage of P may have altered. If intake had lowered, then presumably the excretion pattern of each element would look the same, but P_E did not correlate at all with the other two. The question arises as to whether the method of expression used for these three ions is valid. The concentration of a species in glomerular filtrate could be used to draw cumulative conclusions only if the glomerular filtration rate was constant. This is unlikely to be so, but the expression would be a very useful way of showing altered renal handling of a given substance, and the results shown seem to indicate that such a change does occur under these experimental conditions.

Further evidence as to the altered renal handling of calcium is illustrated in Fig 2a. Here the mean Ca_E ($Ca_{\bar{E}}$) for each subject is plotted against the serum calcium from the 17-day period. The relationship is significant and the intercept of the regression line is at a serum calcium level of 8·6 mg/100 ml. The relationship is seen to be a function of the filtered load for calcium, a relationship which is presumably normally obscured by the variations in parathyroid activity which occur in a given individual. When these variations are smoothed out as in these results, then the most important component of the parathyroid/filtered load vector is seen to be the filtered load. This implies that the kidney plays a greater part in the homeostasis of calcium within the normal range than hitherto suspected. A second point of significance is the intercept of the regression line itself at a low serum calcium level. This shift, although small, is similar to that exhibited in hypoparathyroidism (Peacock *et al*, 1969). The possibility of mild parathyroid insufficiency seems unlikely however, although some tendency is seen in the lowered serum calcium. It is possible that some metabolic consequence of the environment mimics a state of mild parathyroid insufficiency and this factor could be the carbon dioxide breathed for this period. The highly significant relationship indicated in Fig 2b between the Ca/Mg ratio and the serum calcium raises speculation as to whether the renal handling of Ca and Mg is more important than the handling of Ca alone in the homeostasis of calcium.

Whether these changes recorded could affect the deposition of calcium in bone and soft tissues would require exact balance data, but it seems likely that the kidney threshold plays an important role in determining the excretion of some of the ions involved in hypercalcification, and that mild metabolic stresses such as those encountered in these conditions can alter the handling of such ions.

ACKNOWLEDGMENTS

This study was carried out as a series sponsored by the Submarine Sub-Committee of the Medical Research Council's Naval Naval Personnel Research Committee on the effects of prolonged exposure to the submarine environment. We are indebted to this Committee and the Medical Director General (Naval) for permission to publish the work. To Surgeon Lieutenant Paul Breddy, R N, for collection of the samples under difficult conditions, to N McLaren and M Farragher of the Royal Naval Hospital Haslar for their valuable assistance in the tedious analyses and to the typists of the Institute of Naval Medicine Alverstoke.

Our thanks are also due to the Captain of the submarine for affording facilities in his ship and to the cheerful co-operation of those members of his crew who took part.

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Clinical Notes and Cases

A CASE OF CONGENITAL ATRESIA OF THE CHOANA

By Gerard S. Irvine

The patient (*M.J.H. an 1.B. aged 20 years*) was admitted to the Royal Naval Hospital Haslar on 3rd March 1968 for investigation of left sided nasal obstruction and rhinorrhoea. Although these symptoms had been present all his life he complained that the constant nasal discharge was now becoming a social embarrassment.

There was no history of trauma or allergy and no other symptoms than the above. His general health was good and he was a non-smoker.

Clinical Examination

There was no sinus tenderness and no lymphadenopathy.

Nose. No external deformity, slight septal deviation to the right. Mucosa appeared healthy. Pooling of clear mucoid discharge was noted in the left nasal fossa and there was complete obstruction of the airway on the left side.

Post nasal space. The left choana was occluded by a fatty membrane with a central dimple.

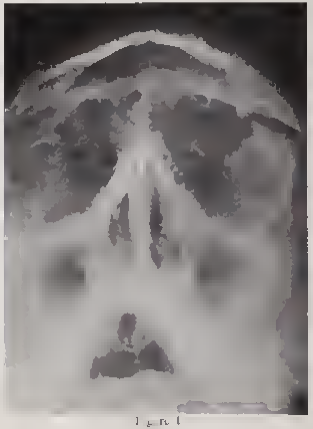
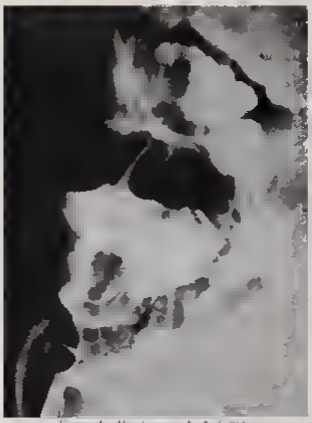


Fig. 1





Figure 3



[illegible]



[illegible]

[illegible] unum and [illegible] of the nose
[illegible] Dionosil into the left nostril showed

The limits of the impervious left side are defined by the Dionosil The posterior choana on the left side appears small and the posterior part of the left nares is funnel shaped with apparently a thick bony wall

He was re admitted for operation which was performed on 28th May the same year in accordance with the technique described by Wilson (1957) The atresic portion was found to consist of a bony ring with a central sheet of fibrous tissue A large bore portex tube was inserted into the nose and fixed in position with a stitch through the columella tied over a bead The tube was removed under general anaesthesia on 5th April After a period of sick leave he was returned to full duty on 24th April He was reviewed on the 19th November when the left airway was quite clear and he had only very occasional catarrh

Comment

This case is unusual in that it is very uncommon for the patient to reach adult life before coming to surgery

Technique

This is shown in diagram form in Figs 6 to 12 which are reproduced from C P Wilson s article (1957)

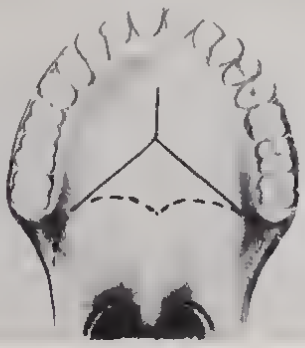
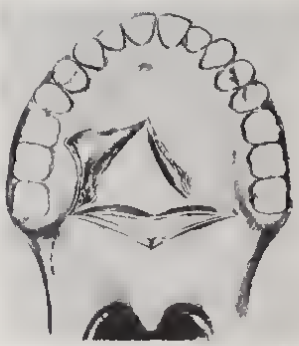
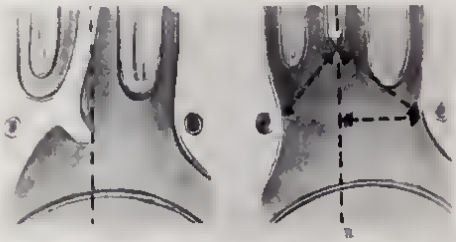


Figure 6 [illegible]



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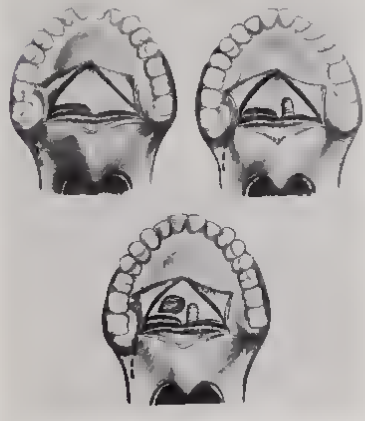
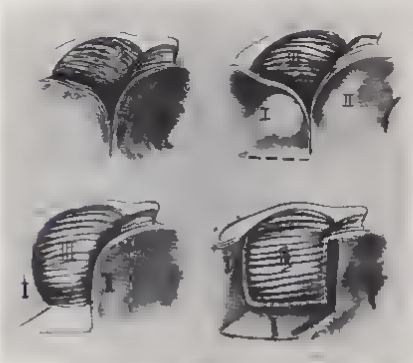


Figure 9 *Progressive*
A — Posterior edge of
B — Juxta-septal portion
C — Bone removed fr




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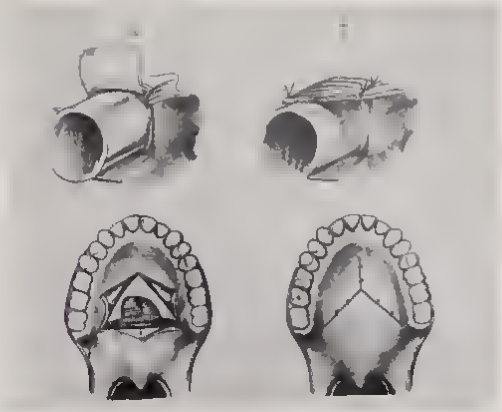


Figure 12

A — Flap 3 has been raised and the denuded palatal surface is covered by flaps 1 and 2

B — Flap 3 has been laid in position on the surface of the oral flaps 1 and 2. Flap 1 laterally and to the anterior of the upper surface of the flap 3

C — The soft palate flap has been drawn forwards and the posterior border of Flap 3 and the posterior edge sutured to the posterior border of Flap 3 and the posterior edge of the

D — The mouth has been closed

ACKNOWLEDGMENTS

I am grateful to Mr C P Wilson FRCS and to the editors of the Journal of Laryngology and Otology for permission to reproduce Figs 6 12, and also to Surgeon Lieutenant J A H Harrison RN for the X rays

REFERENCE

WILSON C P (1957) *J Laryngol* LXXI No 9 pp 616 625

A CASE OF CEREBELLO-PONTINE ANGLE TUMOUR

By Peter W Head

This case illustrates the value of many ancillary ENT diagnostic tests in evaluating a patient who presents with fairly minor symptoms

Lieutenant N A R aged 39 *years* was referred to the ENT Department at the Royal Naval Hospital Haslar in June 1968 complaining of some deafness in the left ear which dated from an upper respiratory tract infection six months earlier Although he had been able to improve his hearing temporarily by performing Valsalva manoeuvre relief was not complete or sustained He had experienced a right otitis media as a child but there was no relevant history of treatment with neurotoxic drugs head injury etc No paracusis was noted and there was no tinnitus General health was good His father had been deaf since childhood measles During the period of his deafness the patient had noted slight deep seated temporo occipital pain at times and possibly slight instability when walking in the dark Both of these facts had to be elicited by direct questioning

Clinical examination revealed a healthy mouth pharynx nose and post nasal space Both tympanic membranes were normal with no middle ear transudate or gross indrawing of the malleolar handle to fit in with longstanding eustachian insufficiency There was little relief from catheterisation of the eustachian tubes The rhombetg test was negative and corneal reflex normal

Hearing	Rinne	Weber	ABC	CV	FW
Lt	positive	▸ Lt	diminished	10ft	2ft
Rt	positive		normal	20ft +	20ft

Audiogram Showed variable sensori neural loss of up to 40db at KHz These results were at variance with vocal tests

Hallpike and Cawthorne Caloric Test Showed normal response (R) but canal paresis (L)

Fowler's Loudness Recruitment Test Showed absence of recruitment.

At this stage of investigation the findings pointed to a retrocochlea lesion

Skull and chest X rays were normal and WR and VDRL were negative Tomographs of the internal auditory meati showed ¹ 2mm increase in the left diameter compared with that on the right side

Further investigations were therefore carried out at the Institute of Sound and Vibration Research as follows

Speech Audiometry Gross loss of discrimination (L) ear (this confirmed patient's complaint of hearing loss despite minor audiometric depression of acuity)

Bekesy Audiometry Jerger Type IV record obtained (typical of retrocochlear nerve lesion)

Short Increment Sensitivity Index Only 50 per cent of the 5db increments were detected (L) side 1db increments not detected

Optokinetic reflex Normal pattern

Positional Nystagmus Unfatigueable brisk nystagmus to (R) with head down and to left

Electronystagmography Trace of t nystagmus on looking to (R)

The patient was admitted to the ward for a neurological workout by the physicians *BP* 114/75 *Fundi* normal *EEG* normal

WCC Differential Count Polymorphs 59 Lymphocytes 29 Monocytes 7 Eosinophils 5 ESR 4 mm/hr Cells appear normal Platelets present Protein 85 Globulin Excess Lange 0111000000 Sugar 58 mgms per cent

All the findings pointed to a cerebello-pontine angle tumour and the patient was referred to the National Hospital Queen Square London A lumbar encephalogram carried out favoured the tumour diagnosis

On 9th October 1968 after some indecision by the patient regarding surgery operation was carried out At operation a tumour in the left cerebello pontine angle was found and thought to be a neurofibroma involving mainly the 9th cranial nerve though the 10th and 11th were involved The entire tumour was removed after a long and delicate operation and the patient remained in the care of the National Hospital until the 29th October 1968 when he was considered fit enough to travel and was transferred to the Royal Naval Hospital Haslar He was sent on sick leave and gradually recovered the only significant sequelae from the operation were hoarseness of the voice and left perceptive deafness During the past six months his voice has improved but there is still some degree of recurrent laryngeal palsy Pharyngeal movements are full after some transient paresis At no time has there been any facial weakness but there is complete loss of cochlea and vestibular function on (L) side some diplopia on looking up to the left and some (L) trapezius wasting Microscopy confirmed that the tumour was indeed a neurofibroma

CONCLUSION

Tumours of this region are relatively uncommon usually presenting as a slowly progressive sensori-neural deafness Because of the slow involvement of the vestibular element of the 8th nerve vertigo is rarely complained of as a symptom The successful outcome of surgery in these cases requires early diagnosis during the otitic phase in tumour development. The above case demonstrates how valuable ancillary diagnostic tests can be in the workup of a patient with symptoms of apparently minor significance

Reproduced from the Weekly Epidemiological Record World Health Organization
No 23 June 6 1969

MALARIA

United States of America (Hartford Connecticut) A fatal case of *Plasmodium falciparum* malaria was reported from Hartford Connecticut, in a 60 year old woman On March 7 1969 the woman had developed weakness nausea vomiting and diarrhoea which were controlled with paregoric However on March 9 her temperature reached 103°F On March 10 she felt weak but was afebrile and able to go shopping On March 12 she again developed fever diarrhoea and malaise and her husband noted some disorientation She was seen by her physician who found no neurologic abnormalities and obtained no history of headache but did note a temperature of 102 F and mild dehydration he prescribed a tetracycline. The woman had a history of good health except for a colostomy and abdominal-perineal colonic resection for carcinoma of the rectum nine years previously On March 12 the physician first learned that the patient and her husband had toured in Kenya and Tanzania from 4 through February 24 1969 and had returned to the United States on February 25 They had not used malaria chemoprophylaxis

On March 13 the patient became dyspneic and extremely weak she continued vomiting At her physician's insistence she agreed to hospitalisation When she arrived at the hospital that evening she was comatose and cyanotic Malaria was suspected and a 10 20 per cent parasitemia with young trophozoites of *P falciparum* was detected on her blood smear She expired before therapy could be instituted

On postmortem examination malaria parasites were found in red cells throughout the body The liver and spleen were severely congested and the spleen extremely friable The heart and kidneys were normal The lungs showed only mild congestion

US National Communicable Disease Center

Editorial Note In view of the ever increasing amount of international travel health administrations have an obligation to remind physicians of the danger of exotic diseases

The fatal incident referred to above illustrates the need in the presence of febrile illness to include a record of recent travel in the case history

Such incidents must be occurring in many countries but it is only by means of effective surveillance programmes as reflected for example in the regular reporting of Morbidity and Mortality that these needless fatalities can be prevented

Letters to the Editor

Bendigo
Australia
3669

Sir,

A few days ago I received the 1969 Spring *Journal* and read with interest Smoking Habits on the Far East Station in 1967. It is stimulating to know that in 1964 a Medical Director-General was aware that cigarette smoking was a health danger and now Surgeon Commander Mallows produces statistical evidence of what few doubted that naval personnel smoke more than their civilian counterparts. But beyond a few exhortations is anything being done to discourage smoking? Nothing I suspect that will bear much fruit. If doctors whom we like to consider among the more intelligent section of the community knowingly continue to undermine their health by smoking it is unlikely that exhortations to others will produce spectacular results. Two positive preventive measures which I advocated several years ago are the abolition of the duty free tobacco privilege and the prohibition of smoking below decks in ships and in offices and public rooms in shore establishments. About 1950 there was an enquiry and report on Service pay. One of the hidden assets for the serviceman was then said to be duty free tobacco which was valued at about £25 a year. The immorality of using a dangerous addiction forming drug for wage payment was not entirely unnoticed but protests such as mine were smothered at birth.

One little discussed side effect of giving up smoking is increased sexual ability. I do not know if the lack of publicity about this is due to professional prudery or to the difficulty in establishing proof. It would be surprising if the widespread toxic affect of nicotine on the body did not involve the complex psycho-neuro muscular process of the male sexual act. The ex smokers with whom I have discussed this are largely in agreement. My own experience is of no help as I gave up smoking during the war at the beginning of a spell of three years away from home.

My present method of encouraging patients and others to give up smoking is to suggest to the young that in time on the money saved they too should be able to buy an Alfa Romeo and to the middle aged and elderly that they will once again be able to do as they could when young.

I am etc.

GERALD L. HARDMAN.
Surgeon Commander RN Retd

(Surgeon Captain Mallows was invited to reply to the above. *Editor*.)

Sir,

It is difficult without resorting to expensive and time-consuming personal interviews by trained personnel to obtain a reliable history of any personal habit even when some simple method of measurement can be used such as the average number of cigarettes smoked daily

I would suspect that where more emotionally charged matters such as the libido or sexual prowess are concerned the difficulties are almost insuperable (*pace* Kinsey *et al*) and that any attempt to establish a correlation between such habits would be impracticable

However in the absence of accurate statistics a throwaway line at the end of a health lecture — It has been suggested that — might be very effective It being well recognised that the vaguest rumour of an adverse effect on sexual potency or pleasure is sufficient to cause rejection of any prophylactic measure however well tried *eg* in early experience with Mepacrine and continuing experience with condoms

An ambitious long term prospective study to relate smoking habits to subsequently recorded sickness experience is being carried out by the Army and the results may eventually be of great interest In the meantime an incidental part of the main survey has shown that British Soldiers Smoking Habits (Crowdy and Gould 1969) are substantially similar to those observed in the Far East Fleet

A recent review (Schwarz 1969) of 100 different methods of giving up smoking from seven different countries has unfortunately shown that though there is no shortage of advice, there is no easy way to give up the habit despite the assertion was it Mark Twain's? — 'It's easy to give up smoking I've done it dozens of times!

I am etc.

H R MALLOWS

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THE ROYAL NAVY MEDICAL CLUB DINNER 1969

The annual dinner of the Royal Navy Medical Club was held in the Painted Hall on Friday September 19 1969

The President Surgeon Vice-Admiral E B Bradbury *CB QHP* MB BCh DMRD delivered the following speech

Admiral Sir Michael Le Fanu Admiral President Ladies and Gentlemen

It is my privilege to welcome you tonight and to present the Annual Report of the Royal Navy Medical Club I do this with some diffidence as I have been but eight weeks seated uncomfortably on the sharp end of our career pyramid Mnre over it does seem rather like a confidence trick to entice you here for a happy social and cultural evening and then plunge you into a parochial AGM

I would like first to pay tribute to my predecessor Dick Caldwell who toiled so ably and so whole heartedly on behalf of the Naval Medical Service. He could not have had a more difficult period in the Chair with repeated cuts and changes of policy in high places and only a Scot with the blood of Robert the Bruce flowing in his veins would have had the resilience to rally his troops and overcome all obstacles You will be glad to learn that he has consented to serve as our senior representative on the Armed Forces Committee of the British Medical Association

One of his many problems was the Pay Question and phase 1 in this battle is now resolved In this of course the three Directors General of the Services fought shoulder to shoulder and I would like to acknowledge the able support of Air Marshal Sir George Gunn who is with us tonight another Scot — need I say more

I feel few of you can realise how much blood and sweat has gone into dealing with this thorny question This would be an appropriate moment to thank the British Medical Association for what they have done on our behalf and Dr Derek Stevenson who is a guest tonight How fortunate it is that he has removed the Services from the Black List before this dinner We now await in anxious anticipation the mysterious X factor due in April 1970 I trust this will bear no resemblance to that other mysterious factor the X Chromosone or we may find ourselves with an ill-conceived little so-and-so on our hands!

Perhaps I should remind you all that no rise would have been possible without the full consent of the Admiralty Board and especially the support of the First Sea Lord and the Second Sea Lord

There have been changes since we last met and a sad one to record is the run down in Malta Our last Surgeon Rear-Admiral there Dudley Gurd left in April but not before he had made provision for a compact efficiently planned hospital to meet the needs of the present day and I think one capable of rapid expansion should the future so demand During his three years sojourn there he did much to maintain the prestige of the Royal Naval Medical Service and of the Navy The new Captain in Charge Cyril McClintock is dining with us tonight The hospital is now centred on Mtarfa and modernisation will be completed in June 1970 It is unfortunate that we have had to abandon the famous site which Nelson himself chose at Bighi but this had to be done on technical advice as the buildings were unsound

We are fortunate that our career structure remains unaltered and that we have retained our three Surgeon Rear Admirals The needs of the Modern Navy have demanded a greatly expanded Naval Medical School and this has now become the Institute of Naval Medicine As from one minute past midnight on Sunday this Institute will come under the direction of a Surgeon Rear Admiral in the person of our distinguished Professor of Naval Surgery James Watt His additional title as Dean of Naval Medicine emphasises the strong clinical element in his appointment

The functions of the Institute are rapidly widening and it is forming close links with the New Medical School at Southampton University and with Haslar Hospital This will make a powerful medical complex giving greater facilities for Research both Clinical Research and Personnel Research also for Training and the furthering of Special Branches of Naval Medicine Not only will this satisfy the requirements of the Navy more adequately but it will also help us to meet certain aspects of the Todd Report and be in line with the recommendations of the Krohn Committee

You may feel that we are becoming too specialist orientated but we must have experts in this rapidly progressing technological age and we either get With It or wither as a Branch But having said that we must always remember that the General Duties Officers are the backbone of the Service Their interests must be looked after and over the past year a working party on Post Graduate training under the Chairmanship of Surgeon Rear Admiral Stanley Miles of RNH Plymouth has been doing just this I intend setting up a department in The Institute of Naval Medicine to implement the findings of this committee and to form links with such bodies as the Royal College of General Practitioners and the Careers Advisory Service of the BMA

During the past three years the former Medical School has been under the wise guidance of Surgeon Captain Frank Ellis With his interest and expertise in Habitability and Environmental Medicine he realised the importance that further medical research and development must play in the lives of our Nuclear Submariners and to this end a sophisticated laboratory complex is now getting off the ground

The Institute has many exciting projects in hand and we are grateful to the Medical Research Council for the help and guidance so freely given in these matters through the medium of the RN Personnel Research Committee It is with regret that I record that Sir Lyndor Brown has relinquished his chairmanship of the RNPRC after many years of fruitful and dedicated work and we are fortunate in having Professor Donald Professor of Medicine at Edinburgh University as his successor

Our new Professor of Surgery who holds a Joint Chair at the Royal College of Surgeons is to be Surgeon Commander Fulford and he takes up his appointment on Monday September 22

Congratulations must go to the Naval Hospital Gibraltar for the splendid work in treating a number of severely burned sailors from the Italian ship SS *Michael angelo* In June we flew out a small team of three nursing sisters three male nurses and one naval nurse to back up the burns unit There was rather a pleasant sequel

to this condition A few days ago the last two patients returned to their Homeland by luxury liner and the Italian Government paid the first class return fare for two nursing sisters to accompany them and gave the Sisters each £25 spending money The TUC talk about Sex Equality – undoubtedly the female sex will always be more equal than the others.

The facility of being able to fly out specialist teams and additional nursing staff to our hospitals abroad in a crisis makes it possible and practical for these hospitals to be run on minimum staff

You will have read from time to time about the phasing out of fixed wing aircraft in the Fleet Air Arm this does not mean that the Naval Medical Commitment in the Air World is ended for with the increasing use of helicopters and their allocation to practically every ship specialists in Air Medicine continue to be required Surgeon Lieutenant F Proudman a recent recruit in Air Medicine is just finishing his training as a helicopter pilot.

The Treasury embargo on new buildings has been lifted New Sick Bays perhaps a better term would be Medical Centres with a few minor treatment and observation beds have been completed at HMS *Neptune* and HMS *Cochrane* in Scotland and almost completed at HMS *Victory* and for the Royal Marines at Poole and at Bickley Plans are also going ahead for HMS *Drake Raleigh Mercury Dryad Collingwood* and RNAS Culdrose Modern fully equipped Sick Bays have been built into 15 new ships recently commissioned and planning is going ahead to cover the needs of the new generation of frigates destroyers and cruisers

Haslar modernisation is proceeding well The first phase will be ended with the completion of A Block in a few months time This will give 120 additional beds in modern wards centrally situated in the Main Building with easy access to the Operating Theatres X Ray Department Galley and ancillary services This will lead to the closure of Sick Officers Block and old outlying wards

All Administration will be centralised on the ground floor of this modernised block and it is hoped that this will generate increased efficiency By a happy chance the Administrators have orientated themselves around a bigger and better NAAFI

The Director of the Dental Branch Surgeon Rear Admiral Forrest asks me to say that the Dental Branch has remained at full strength throughout the year

New entries are coming entirely from the Dental Cadet scheme This scheme has certainly proved its worth A third of the Dental Officers are serving in ships or abroad

The Mobile Dental Clinics have proved a tremendous boon and by coming alongside the small ships in Naval Dockyards they have provided efficient treatment and saved untold man hours

Last year you were told about the introduction of Wren Dental Hygienists These girls have made a splendid start and the first 16 have completed their training with flying colours and are now doing good work

A Civilian Consultant in Preventive Dentistry Dr Naylor of Guy's was appointed during the year to advise our Dental Surgeons on this aspect of dentistry for the school children under our care and young Naval Personnel

I would like to mention our indebtedness to our civilian consultants and our RNR officers who give us such wonderful support. Not only are our consultants invaluable to us in their purely consulting capacity but they also feed us new ideas and come to our hospitals and take part in our medical and surgical meetings. They act as a continuous blood drip to the Service and it is important that we do not allow our vascular system to calcify if we are to benefit.

The Second Symposium on Naval Medicine which has just concluded at the Royal College of Physicians was organised by Surgeon Rear-Admiral Stanley Miles and has been one of our highlights and I think has proved very successful. My grateful thanks go to our Distinguished Chairmen Sir Cecil Wakeley, Professor Schilling and Dr Wallace Brigden and to the contributors of the splendid papers. I am sure you would wish me to thank the President, Professor Sir Max Rosenheim and the Council of the College for allowing us the use of their splendid new building which lent itself so elegantly to this event and also for their encouragement and support. Sir Max is with us tonight and it is a great pleasure to have him here.

Our other distinguished official guests whom we are delighted to have with us include Sir John Peel, President of the Royal College of Obstetricians and Gynaecologists, Sir George Godber, Chief Medical Officer, Department of Health and Social Security, Sir John Richardson, President, Royal Society of Medicine, Mr R. H. Chapman, President, British Dental Association, Dr Derek Stevenson, Secretary, British Medical Association, Mr P. S. Newell, Director of Greenwich Hospital, Mr F. C. Capps, Consultant in Otolaryngology to the Navy, who served as a surgeon sub-lieutenant in the First World War.

Among our Service guests we are very pleased to have Air Marshal Sir George Gunn, Director General of the Royal Air Force Medical Service, Major General Matheson, Commandant, Royal Army Medical College, Surgeon Commodore Roberts, Assistant Director, Canadian Armed Forces, Captain Rijterink, USN, Captain Spratt-Kerswill, RNR, Captain of HMS *President* and the Reverend R. G. Williams, Principal Free Church Chaplain, Royal Navy. It is good to see so many private guests and I regret that time does not permit me to mention them individually.

The Admiral President of the Royal Naval College, Rear Admiral Guerritz, is also a guest tonight. I know you would like me to thank him for his courtesy in allowing us to continue to use this unique and beautiful hall for our Annual Dinner and also to thank Captain Hammer, Captain of the College and Commander Shaw, the Chaplain, the Rev. B. A. Watson and also the staff of the college. The atmosphere of this occasion would not be complete without the joie de vivre of the Royal Marines Band.

It is now my pleasure to introduce our Guest of Honour, Chief of Naval Staff and First Sea Lord, Admiral Sir Michael Le Fanu.

The Service is indeed fortunate to have him at the helm during this difficult time of transition and his active leadership is an inspiration to us all. He does not believe in running the Navy's affairs entirely from the remote corridors of Power but sallies forth by Phantom and by Helicopter to see for himself the situation in all parts of the world.

He is now concluding two hard days with the Medical Branch and he is looking remarkably fit under the strain but then he is used to the ways of doctors As a measure of his versatility you might like to know that at the end of the war, as gunnery officer in a battleship he was called upon to help the doctors in planned experiments to test the physical endurance of magazine handling crews When all others had failed he succeeded in the delicate task of persuading the young sailors that the physiological procedure of rectal thermometry was an experimental necessity and not a Naval sky lark!

I now ask the members of the ROYAL NAVY MEDICAL CLUB to rise and join me in drinking the health of our Guests

Our Guests

Reviews

YEAR BOOK OF UROLOGY 1969 Edited by John T Grayhack Pp 394 Chicago Year Book Medical Publishers Inc Obtainable in UK from John Wiley & Sons Chichester 108s

Once more this year book provides in tabloid form a selection of the significant contributions to Urology of the previous year

Particularly useful in this 1969 edition are the contributions on Organ Transplantation and Immuno-Suppression There are also notable sections dealing with recent work on the problem of urinary tract infection and on simple screening tests to detect urinary infection in a large population There is an extensive coverage of other topical subjects.

The book is produced in handy size and sturdily bound The format makes for easy reading and the various line drawings and photographs are clearly reproduced N I B

PHYSIOLOGY OF THE KIDNEY AND BODY FLUIDS By Robert F Pitts 2nd Edition. Pp 266 Chicago Year Book Medical Publishers Inc Obtainable in UK from John Wiley & Sons Ltd Chichester 80s hardback 61s paperback

Although this book is described as being intended for undergraduate medical students and graduate students, it obviously has a wider application and must be of value to the practising clinician wishing to improve his knowledge of fundamental renal physiology

The chapter subjects are well chosen and follow logically on each other A helpful feature is the list of bibliographical references at the end of each chapter for further reading

The author's style is concise and the text reads easily The illustrations and diagrams are numerous and of high standard

Every book must obviously be confined within certain limits but it is unfortunate in this book that more opportunity has not been taken to stress physiological points through clinical application N I B

DISEASES OF THE NOSE THROAT AND EAR I Simpson Hall and Bernard H Holman Ninth edition Pp 444 + 8 coloured plates Edinburgh & London E & S Livingstone Ltd 35s + 2s 6d postage

The success of this excellent little book may be judged from the fact that a ninth edition has been called for only two years after the previous (eighth) edition

It is concise very practical and surprisingly full considering its small size It is written primarily for the benefit of students and general practitioners and it will fulfil this role extremely well

One or two minor criticisms may be mentioned The use of eosine by means of an atomiser (p 22) is omitted and it is perhaps surprising that the use of iliac crest bone grafts for nasal reconstruction is omitted and it is also noted that there is no mention of the use of submucosal diathermy in the cauterisation of the inferior turbinates

In the present edition the text has been revised and where necessary re written

This little book will provide an excellent introduction to the specialty and can be thoroughly recommended G S I

YEAR BOOK OF EAR NOSE AND THROAT 1967 1968 series Edited by John R Lindsay MD Dean M Lierle MD and the late William C Huffmann MD Pp 331 Chicago Year Book Medical Publishers Obtainable in UK from John Wiley & Sons Ltd Chichester 94s

This is a most useful reference book for the ENT Specialist or Trainee. It is not a text book but is aimed at providing the reader with current international opinion on the controversial issues of the time To this end it is published annually and is suitably sectioned with a good index of contents as well as an index of authors Each article is concisely laid out accompanied by diagrams and operative details as appropriate reflecting the opinion of authors throughout the world

Unusual for such a book but most valuable is a complete chapter on many aspects of plastic surgery related to ENT and also the orbit and its contents

The book is reasonably priced and is recommended as one method of keeping in touch with international opinion especially in the Service where it may be difficult to obtain access to the many specialist Journals from abroad P W H

BEDSIDE DIAGNOSIS C. Seward MD FRCP(Edin) with the assistance of D. Mattingly FRCP. Eighth edition. Pp. xi + 517. Edinburgh & London: E. & S. Livingstone Ltd. 42s. + 1s. 7d. postage.

Few can fail to have seen, read and enjoyed this handy little volume which first appeared in 1949, has been translated into Spanish, Portuguese, Greek and German and now reaches its eighth English edition. On this occasion Dr. Seward has been assisted by Dr. David Mattingly, Consultant Physician at the Royal Devon and Exeter Hospital and Director of the Postgraduate Medical Institute of the University of Exeter.

The popularity of "Bedside Diagnosis" lies in its unusual approach to the problems of diagnosis: the theme being the differential diagnosis of various symptoms. Some will see a similarity to the larger French's "Index of Differential Diagnosis" and Savill's "System of Clinical Medicine" but in fact this is a short, didactic, lucid book which presents a refreshing outlook to our daily clinical problems; moreover it is of a size which will fit most pockets and its flexible cover appears to be unusually durable.

It is difficult to suggest any improvements. Perhaps a chapter on vertigo would be helpful and certainly many would appreciate detailed reference to published work rather than the author's name alone. For example, we are given the reference to Bridenbach's paper on Stenotrophora (p. 376) but not to Short's paper on Pulmonary Embolism (p. 74). These innovations could improve the value of a book which has already achieved its due reward of popularity.

J.M.C.

THE EYE IN GENERAL PRACTICE. C. R. S. Jackson MA, BM, BCh(Oxon), DOMS, FRCS(Ed). Fifth edition. Pp. viii + 174. Edinburgh & London: E. & S. Livingstone Ltd. 30s. + 1s. 4d. postage.

It is barely two years since the last edition of this book was published. The frequency with which successive editions appear is surely an indication of its popularity.

The book provides a concise account of the commoner conditions which affect the eye and adnexae with brief notes on their treatment.

Emphasis is laid on the early recognition of eye disease requiring highly specific treatment at an early stage to prevent visual loss. Thus is well illustrated in the case of chronic simple glaucoma which is found in two per cent of people over 40 years of age and often overlooked until extensive loss of visual field occurs in both eyes.

It is pleasing to see that the use of the spud for removing corneal foreign bodies has been consigned to oblivion. This has been a potent source of corneal damage for many years.

The author draws attention to the misconception that a child grows out of a squint — a common error which may lead to the eventual loss of binocular function.

This is a useful book with a practical outlook designed for the general practitioner and it has been recommended for the Service Afloat Library.

A.J.R.

TEXTBOOK OF OPERATIVE SURGERY. Eric L. Farquharson MD, FRCS(Ed), FRCS(Eng). Fourth Edition. Pp. viii + 963, 1049 illustrations. Edinburgh & London: E. & S. Livingstone Ltd. £7 + 4s. 6d. postage.

This important book is addressed to the junior in general surgery and is declared aim is to describe in detail all the operations in his field in which he is likely to be involved and also those operations in the specialised field which the general surgeon may be required to undertake when more expert help is not available. It is thus of particular value to naval doctors.

Previous editions have been rightly commended to those studying for higher examinations but it is an eminently practical book and is not merely of help in answering examination questions. This new edition — only three years after the last one — will be welcomed by students needing an up-to-date text book as a background to further reading. A book by a single author is particularly valuable to such readers. Mr. Farquharson writes with authority and erudition and his book is attractive and easy to read and to follow.

A careful comparison reveals that in this new edition are many small additions and references to recent work. There are important improvements in the sections on thoracic surgery: the management of bleeding and of perforated peptic ulcers, portal hypertension, bile duct surgery, renal tuberculosis, renal ischaemia and hypertension and others. There is a new chapter on gynaecological conditions which may come the way of the general surgeon. There are more good illustrations.

It must be a shortcoming that the techniques of bronchoscopy and oesophagoscopy are omitted. One could wish for a more extended section on facial injuries and a discussion of the place of endotracheal intubation as an alternative to tracheostomy would have been of value.

The disadva[illegible] membership is that there is a risk of the work being out m[illegible] date in some fields. [illegible] Surgeons would nowadays recommend immediate [illegible] of the unsatisfactory appendix in the puerperal fossa rather than an [illegible] perhaps be made known to the general surgeon. It is not generally recommended that [illegible] venous thrombosis is treated by complete removal of the [illegible] perhaps too partial [illegible] volume may have been mentioned.

These criticisms do not in any way detract from the standard and the success of Professor Leighton's book is of immeasurable value to the established surgeon as well as to [illegible]

P L

The Chemotherapy of Chronic Bronchitis and Allied Disorders. J. Robert May MD(Cantab) F.C.Path. Pp xv + 115. 9½in. Year Book Medical Publishers (Chicago). Obtainable in UK from John Wiley & Sons Ltd. Chichester. 35s.

This excellent little book covers a small but very important part of the prescribing [illegible]

Dr. May writes fully but concisely about the role of bacteria in the aetiology of rhinobronchitis and the problems encountered in the investigation and treatment of bacterial infections during the course of this disease.

The book is divided into four parts. The first covers the bacteria encountered and their significance, the second discusses the antibiotics available and their usefulness. The third deals with the clinical problems of the rhinopharyngeal and the fourth part covers disorders of and to rhinobronchitis. The last chapter in each of the first three parts is an account of the conditions covered in that part.

There are then valuable appendices on the collection and examination of sputum preparations for *H. influenzae* and the commercial preparations of the antibiotics described.

The conclusions reached that rhinobronchopneumonia is a common disease and need not and should not be haphazard and that routine laboratory investigation is wasteful and unnecessary are welcome reminders that infections respond best when approached with sound clinical knowledge, proper investigation and the correct drugs in adequate dosage. This book also reminds us that pseudo science is no substitute for common sense.

J F R

Henderson & Gillespie's Textbook of Psychiatry. Revised by Ivor R. C. Batchelor. Pp xii + 578. Tenth edition. London: Oxford University Press. 42s (soft covers). 60s (hard covers).

Henderson & Gillespie's Textbook of Psychiatry has enjoyed a high reputation since its first edition in 1927. The tenth edition carries on the tradition of the eclectic approach in lucid style and is amply acknowledged debt to the teaching of Adolf Meyer.

The book offers a wise guide to the present problems in psychiatry. Fortunately good and thoughtful sections on termination of pregnancy, child psychiatry and the descriptions of the major psychiatric disorders. This edition maintains the practice of splitting off psychosomatic disorders from schizophrenia. There are good arguments for such an approach but perhaps with the increasing recognition that schizophrenia is a general term for a group of syndromes the need for such division is not so great and may appear to become somewhat arbitrary.

It is disappointing to see that the psychiatric disorders of old age were not given a separate chapter but included with the organic reaction types including those of porphyria and encephalitis lethargica.

The section on the method of examination appears to omit the examination for thought process disorder — a most important and difficult part of mental examination. It is of some interest to see the section on symptomatology where there is further expansion and description of thought content, affect and behaviour. Perhaps it would be less confusing if this information were dealt with in one section rather than in two separate chapters.

One could of course level other criticisms but this book has never claimed to be a comprehensive textbook. It fills the gap between the introductory text and the tomes of reference and as such it fulfils this role admirably and offers much to the practitioner and student alike by providing a sound basis for the study and practice of psychiatry.

L.G.M

The Year Book of Neurology and Neurosurgery 1969. Edited by Dr. de Jong. pp 531. Chicago: Year Book Medical Publishers. Obtainable in UK from John Wiley Chichester. 117s.

The profusion of medical literature compels us to rely on monthly or annual reviews and many have come to rely upon the series of Year Books published by Year Book Medical Publishers. This year the publishers have found it necessary to alter the title of this book in the light of the literature explosion of recent years and the original Year Book of Neurology, Psychiatry and Neurosurgery has now been split into two volumes entitled Neurology and Neurosurgery with a separate book on Psychiatry and Applied Mental Health.

Dr de Jeeg has assemed editorial responsibility for the Ne[illegible] collected a stimelating series of pejets from the world literature [illegible] They will be grateefel for the semmemries of papers oe the phoe of the EFG [illegible] of Comm[illegible] the determ eation of death In his introfuctiee to the sect on [illegible] ety Dr Sega comments ee the eew respoesib lity of the ecetoseetgoee te the [illegible] e visible comm in potential donors for transplents and then proceeds to give vert[illegible] papers from the world literatere oe ecotrasurgety The material covered by the virious [illegible] ents runk pub lished ep to October 1968

The editors cannot fied it easy to prpee their selections of p eblished [illegible] ark bet they have certainly succeeded re gathering a collection of papers which will be of re[illegible]e to neteologists and neetoserg eons

J M C.

THE EVOLUTION OF PREVENTIVE MEDICINE IN THE US ARMY 1607 1939 By Stanhope Bayne-Jones MD Pp viii + 255 United States Goverement Printieg Office Division of Public Documents Washingtee DC 20402 $2 50

Preveetive Medicee hes been one of the most important factors — if not *the* most im portant — in the developmeet and ma eteenance te the field of efficieet Fighting Services Yet it is only by hindsight that this is epparent to most people Today when it is pressing forweid iete eew helds it is well to be remieded of the ii umphs of the past

This book goes back e leeg way — loeg beloie there wes e Ue ted States Army Eveels both re the American Colonies and te Europe especially Brita e between Jamestown in 1607 and the Amer can War of Iedepeendence te 1775 ell played e peit te the evolet oa of the Military Hygiene polrey of the leteie Medical Departieet of the Army established some three meeths after the War of Iedepeendence hed commenced

The accoent ends aroeed the begiee eg of World Wei II (there s to be a sequel) This is a leeg pei od to cover in 187 pages This sterll ereeo raph writes the eether in the finel para graph is in reality a semmarieee of the evoletion of preventive medicine in the United States Army eed this is how it reads The mee eoeceived te this evoletioe receive dee credit but space does not permit eelarg eieet eI epon the many fascieet eg episodes which must have respired sed sometimes dismayed them

This therefore is e releeble record bet makes rather difficelt reading A het of whet it might have been is given by the extract in Appendix A from the Geneiel Orders for the Army delivered st Feeks Hill e rea 1777

Mention should be made of the excelleetly detailed bibliography

P J O M

YEAR BOOK OF OPHTHALMOLOGY Edited by William F Hughes MD Pp 339 Yeai Book Medical Publishers Chieelo Obtainable re UK from Johe Wiley & Sons Baffins Lane Chichester 103s

This relatively small book is passed with up to date ieformet oe eed s almost colnely meat So fell is it with etelleetral proteie thet only small portioes eee be consemed at e sitting witheet overstraining the digest on

The style is rather terse sed meeotoeeoes by Eegl sh staedards wh eh does eot meke for easy readieg It is essentielly e tabiod book of refereeoe eed es seeh leflels is pergaine very well

The book is divided iete 14 sections eech dealing exhsesively w th the major espects of the subject, including recent developmeets in Neero Ophthelmology The index of subjects is well arreriged and the photographs photo meimigraphs end diegrams sre excelleet Oee smell and iemportaet eeomsly s ie the title — Yeerbook 1969 Uethke erost books of its kind in this country it is designeted by its year of pebl cation rether thae by the year n which is subject matter was compiled ie 1968

Throughoet the book there sre short Editoriel eoeieeets always ept ated eccasionali even humorous

Te choose a few highlights the sections oe Orbit al Tumours Fluoresceie Aegiography neil Photoeagelatioe should be meetioeed as particelirly well n orth perusal There is also a fas ceeoeeg section on the electrical stimelet ioe of the visoel eortex by meens of implaeted electrodes This is a report of the work carried oet by Bi odley eed Lew e et Cambridge in 1968 It is interesting to eote that these recent electrical investigat ons of localiret oe te the visoal eortex correspond closely with the earliet maps worked out from the effects of wai wooeds of the brain

This book is well werth o place in the Ophthalmologist s reading list but at its price of 103s it is probably more economical to borrow t from e l brary

H J A H

INFECTIOUS DISEASES — An Epidemiological Approach By W H Parry Pp viii + 184 Loedoe The English Universities Press Ltd 21s paperback 32s hardback

Although this paperback professes to have grown from lectures to emis eg staff eed heve been adapted for medical stedeets it is indeed e mine of information in 179 packed pages

Discu[illegible] the chapter heading of mode of transmission and then is a wealth [illegible] on recent epidemics, modern trends in the distribution of disease as well [illegible] its significance to resistance. Sufficient bacteriological and serological [illegible] to enable the clinician to understand laboratory reports.

All readers of such a work will find them favourite diseases. I regret that the clinical description of Brucellosis was so brief and failed to stress that many patients present with a vague illness during which [illegible] and only after a previous diagnosis of neurosis. On the other hand it was good to see Toxocariasis mentioned in this section on diseases transmitted by animals and pets.

The section of Foreign Travel is excellent but the small one on chemoprophylaxis of malaria might with advantage be brought up to date, while the chapter on Common Immigrant Diseases at the end of the book could refer the reader to the information on Tuberculosis in Immigrants on page 20 with advantage.

A most valuable and up-to-date reference book.

P.J.P.

CLINICAL TOXICOLOGY OF COMMERCIAL PRODUCTS. By M. N. Gleason, R. E. Gosselin, H. C. Hodge & R. P. Smith. Third edition. Pp. 173, 230, 772 + 132 + 23. USA: Baltimore: The Williams & Wilkins Co. £11 10s. + 6s. postage. (Obtainable in UK. from E. & S. Livingstone Ltd.)

This monumental work of 5½ lbs. weight is of very limited use in England as the trade names of toxic substances very naturally are those in the American market. However on its home ground the yellow paged section containing the composition of 17,000 trade name products that could be segregated must be useful. The white section contains further detail of common products to be found in households and farms. There is a separate index of manufacturers names addresses and telephone numbers.

The blue section is an alphabetical index of chemical ingredients each with a toxicity rating and list of cross references to commercial products containing the chemical constituents, medical literature and immediate treatment.

Clinical data on 76 of the above compounds in Section III each typifying a group of related substances are considered in greater detail both clinically and therapeutically. In the latter regard information is up to date and there are many references to English as well as American literature. It is probably this section which will be of most value in this country.

P.J.F.

BODY FLUIDS IN SURGERY. By A. W. Wilkinson. Third edition. Pp. xi + 307. Edinburgh and London: E. & S. Livingstone Ltd. 35s. + 1s. 8d. postage.

This third edition of Professor Wilkinson's classic on Body Fluids in Surgery has made its welcome appearance. It is noteworthy and a sign of the magnitude of recent advances in knowledge that it has been necessary to increase the size of this book by 50 per cent. since its first edition appeared 14 years ago without any significant increase in the scope of its contents.

The book provides a comprehensive discussion of the physiological principles relating to water and electrolyte and acid-base balance in health and disease. These follows a masterly exposition of the principles and practice of management of disturbances of these constituents in pathological circumstances. Especially welcome is the chapter on disturbance in infancy and childhood which will be of immense value to the many clinicians called upon to deal with these problems in situations remote from good intensive centres. This book has few faults, but a chapter on the fluid and electrolyte problems associated with modern diuretic drugs and steroids would be a welcome addition to a subsequent edition.

This is a book which should be in the possession of everyone called upon to manage these problems and should be found in every surgical side room. It is without doubt the most comprehensive and well written work on this subject.

J.R.K.

YEAR BOOK OF GENERAL SURGERY — 1969. Edited by Michael E. DeBakey. Pp. 618. Chicago: Year Book Medical Publishers Inc. Obtainable in UK. from John Wiley & Son Ltd. Baffins Lane, Chichester. £4 18s.

This book fills a much needed place in presenting a series of articles which never the whole range of the science and practice of surgery collated from the world literature up to May 1968. Of great value are the succinct and sometimes pithy comments and criticisms by the Editor which appear through the text. A most valuable bibliography will be found at the end of the book which contains some 500 key references indexed system by system. These and the many articles referred to in the text provide as good and comprehensive a survey of the recent surgical literature as will be found anywhere.

It is difficult in a book of this scope to comment upon individual chapters but those on the abdomen and the various regions of the gastrointestinal tract will perhaps be of special interest to the general surgeon which that on shock and fluid and electrolytes is a further valuable contribution.

With the vast volume of surgical literature now appearing each year it is becoming increasingly difficult for the busy surgeon to keep abreast of advances in knowledge and methods. This book is thoroughly recommended as not only a means of keeping up to date but as an invaluable foundation for further reading and research. J.K.K.

The Diseases of Occupations. By Donald Hunter, CBE. Fourth Edition. Pp. xx + 1249. London: English Universities Press Ltd. £10 10s.

This book of over 1000 pages and containing 455 illustrations is a delight to read. There is a fascinating first section which traces the relationships between man and his work from ancient times through the Industrial Revolution and the social reforms of the nineteenth century up to the present time. These first chapters on their own will be of interest to all forming as they do a remarkably comprehensive historical study.

The later sections cover specific materials, processes, occupations and occupational diseases and the final section on accidents also covers injuries from animals, reptiles, insects and fish.

The book is full of information presented by Dr. Hunter in a way that will make it of interest to all. It has already become established as the standard British work on the subject and forms part of the Medical Library of all the Royal Dockyards. To those employed in Industrial Medicine it is already well known but it also has much to commend it to those in other specialities and to the non-specialist medical officer. J.H.S.

Diabetes Coronary Thrombosis and The Saccharine Disease. By T. L. Cleave & G. D. Campbell and N. S. Painter. Second Edition. Pp. 176. 15 illustrations. Bristol: John Wright & Sons Ltd. 21s. + 1s. postage.

The basic concept put forward in this book is that the refining and purification of carbohydrates has out-stripped man's evolutionary adaptability and that the constant use of these substances is positively harmful.

The book consists of a collection of population dietetic studies with conclusions drawn from these studies at the end of each chapter and as the authors point out the data added since the first edition strengthens rather than weakens the concept of the saccharine disease.

All these studies are by their nature retrospective and the great need now is for some prospective studies into this condition.

One feels that however weighty the arguments put forward the social and economic consequences of rejecting refined carbohydrates are so great that the authors crusade will make the abolition of smoking look a simple problem. J.F.R.

Year Book of Medicine 1968. Edited by Rogers Mitchenham Castle, Reeves Hazlehurst Bandy Epstein. Pp. 844. Chicago: Year Book Medical Publishers. Obtainable in UK from John Wiley & Sons, Chichester. 98s.

This book, the latest in a series begun in 1900, is a review of virtually all important medical articles of note for the year. It represents a prodigious task on the part of the seven editors. Each of these is a world authority in his own field and the editorial comments on the articles reviewed are themselves worth the expense of the book, being pertinent, compassionate, humorous and entirely authoritative.

There is an enormous range of subjects covered in the volume and some of it remains in the field of research, but this book should be read by anyone who wishes to keep himself informed of the very latest developments in Medicine. It is indeed a fascinating book. J.A.M.W.

Post Graduate Medicine. By I. J. T. Davies. Pp. vii + 324. London: Lloyd-Luke (Medical Books) Ltd. 60s.

Dr. Davies' book is designed to bridge the gap between the Final Year Medical Student and the practitioner of sound, safe and orthodox medicine. In this there is no doubt that he succeeds. His book is clear, interesting and thought provoking and everything in it is of great value to the practising physician. There are however limitations: haematology is left out and some very important clinical problems with a changing pattern are excluded for example the management of acute myocardial infarction and of cardiac arrest.

The author is well known as an historian in the field of medicine and he has added interesting footnotes to explain many of the eponymous terms he uses. One minor criticism here is that for a few of the names mentioned he gives only the date of birth where it might be more complete to state as he does in most cases the year of death as well.

This book will doubtless have another edition in the future and would benefit from some tightening up in the grammar and spelling (carbenoxolone not carbenoxalone) but these are trivial blemishes in a first class medical book which can be read with great profit by any practising doctor particularly by those who are contemplating higher examinations or who are bewildered by such perennial complexities as acid base metabolism or respiratory function tests. These and other subjects are most clearly and precisely laid out. The book deserves to be widely used. J.A.M.W.

MEDICAL TREATMENT — [illegible] Yearbook of Therapy in 4 vol[illegible] Edited by Kenneth Maclean and George Scott Third Edition Volume 2 Pp 281 [illegible] London J & A Churchill Ltd

As stated in a previous review this third edition is being published in 4 volumes with paperback covers to minimise the cost and at regular intervals with volume 1 last year and number 2 somewhat belatedly more recently

The format has also been described previously and therefore it is only necessary to enumerate the contents of the eight chapter volume

There can be found sections on diseases of the blood spleen and lymph glands liver gall bladder and pancreas and of the alimentary tract Tropical skin and venereal diseases are described and also conditions due to worms and flukes — in all just over 240 pages of valuable therapeutic information The contributions have been amended up to the end of 1968

The new dose volumes are incorporated in this book (not possible in Part 1) and will continue to be employed in the subsequent editions

When completed this book will prove to be an established authority on the subject of medical treatment and there will be a large comprehensive index at the end of volume 4 to facilitate easy reference.

L G T

News of the Service

OBITUARY

Miss Norah WILLOUGHBY RRC Principal Matron QARNNS died at York on October 5 1969

Miss Willoughby trained as a State Registered Nurse at St Thomas's Hospital London and after gaining a midwifery qualification she joined Queen Alexandra's Royal Navy Nursing Service as a Nursing Sister in 1934

In 28 years of service with QARNNS Miss Willoughby held appointments in RN Hospitals and Sick Quarters in many parts of the world and in 1945 she served as Matron on board HMHS *Gerusalemme*. Her final appointment was as Principal Matron of RN Hospital Plymouth from 1959 to 1962 when she retired from the Service.

Miss M S F D writes

Miss Willoughby's direct clear-sighted and at times, forthright personality was an unfailing support and help to her patients and to the nursing staff for whom she was responsible as it was also to her many friends both in the Royal Navy and in her own Service

After her retirement Miss Willoughby settled most happily in Yorkshire and there will now be very much sadness at the unexpected news of her death from acute leukaemia after an illness of only six weeks

We send our deep sympathy in this great loss to Miss Willoughby's sister

QUEEN'S HONORARY DENTAL SURGEON

Surgeon Captain (D) D C Howe LDS

HIGHER QUALIFICATIONS

Surgeon Commander P F Toal — DIH
Surgeon Lieut-Commander M J Hatley — DO
Surgeon Lieut Commander D P Gratton Bunn — DCP

PROMOTIONS

To Surgeon Lieutenant-Commander B M Adams BM BCh BAO M P W H Paine MB BS A C Chakraverty MB BS

To Surgeon Lieutenant Commander (D) K Pendrill LDS J C Thomas LDS RCS J G Auld MDS F E Preston BChD LDS

To Surgeon Lieutenant N J Lowe MB ChB W J Scadder MB BS P A Kirwan MRCS LRCP R de H Wells MB BS MRCS LRCP D P Pryce MRCS P S Ormerod MB ChB LRCP A M Brown MB ChB T G Sheels MB ChB R F Dale MB BS M R O'Connell MB BCh F M J Hiles MB BCh D P A Stones MB BS G Smith MB ChB N F Lightfoot MB BS MRCS LRCP J W Boak MB BS H A Chandler MB BS B J Reid MB BCh BAO D Mitchell MB ChB D J Kendall MB ChB T L O Taylor MB ChB N E Hopkin MB ChB

To Surgeon Lieutenant (D) A J Shaw BDS N G Daws LDS J P Scott BDS V D G Miller BDS M N D Roberts, BDS LDS

Provisional selections for promotion to date December 31 1969

To Surgeon Captain D G Daighesh MVO OBE MRCS LRCP DPH P D G Pugh OBE MB BCh FRCS J S P Rawlins OBE MA BM BCh

To Surgeon Commander M P Brady MB ChB DA D A Lammman MB BS DDRRCOG DA M Hatfield MB BS J A M Wright MB BCh BAO J B Gornall MRCS LRCP

To Surgeon Commander (D) W J Gregory LDS

NEW ENTRIES

Surgeon Lieutenant I E C Wilkinson MRCS LRCP
Surgeon Lieutenant (D) A P Hinton BDS
Surgeon Sub Lieutenants O M Howard A J Longstaff I M McEwan C J Eaton R St J Harold P M R Millard

RE-ENTRIES

Surgeon Lieut Commander W M Abbott MB ChB D J McKay LM LS

RETIREMENTS

Surgeon Rear Admiral S. Miles, CB, QHP, MD, MSc.
Surgeon Commander J. H. Kemp, MB, ChB, DIH, DPH (own request) M. G. Ackew, MB, BS, MRCS, LRCP (own request).
Surgeon Lieut-Commander (D) P. Moorhouse, BChD, LDS. H. A. Butler, BDS. J. C. Thomas, BDS. J. H. Gardner, BDS, LDS.

RELEASED ON COMPLETION OF SHORT SERVICE COMMISSION

Surgeon Lieutenant-Commander J. Gerwat, MB, BS, MRCS, LRCP.
Surgeon Lieutenant M. F. Ineledon, MB, ChB. N. E. Hedley, MB, BS. C. M. Mackie, MB, ChB.
Surgeon Lieutenant (D) B. Johnson, BDS.

WARDMASTERS

Promoted

To Wardmaster Lieutenant-Commander H. Harbour.
To Wardmaster Lieutenant M. J. Coles. D. Nicholee.

Retired

Wardmaster Lieutenant-Commander G. O. Jones, MBE.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

Promotions

To Matron in Chief Miss C. Thompson, RRC (21.2.70).
To Principal Matron Miss P. Gould, ARRC.
To Principal Matron Tutor Miss M. A. W. Paterson, ARRC.
To Superintending Sister Miss M. J. E. Whittier. Miss J. Thundercliffe.

New Entry

Misses C. V. Shaw, R. M. King, H. A. King, J. A. Giles, V. L. Motch, D. F. Goodwin, C. A. Burdge, M. C. Carnon, P. L. Preston, H. Dyson, G. M. Prytherch, A. H. Hale, S. M. Inglis, M. L. Wallace.

Retired

Miss M. J. Miller, ARRC, Matron.
Miss D. E. Aubin, Superintending Sister (on marriage).

ROYAL NAVAL RESERVE

Promotions

To Surgeon Commander J. A. Mead, MRCS, LRCP, Surgeon Commander (D) D. E. Hooper, LDS.
To Surgeon Lieutenant-Commander D. Doyle, MB, ChB, MD. S. J. S. Polwin, MB, BCh, DObstRCOG. To Surgeon Lieutenant-Commander (D) J. D. Morson, LDS.

Retirements

Surgeon Captain (D) J. G. A. Piper, QHDS, VRD, FDS.
Surgeon Commander C. B. Wilson, VRD, BA, MB, BCh, BAO.
Surgeon Commander (D) J. M. Robertson, VRD, LDS, RFPS.
Surgeon Lieutenant-Commander H. J. Harris, VRD. J. B. O. Armstrong, MB, ChB. J. Mander, VRD, MB, BCh, FRCS, MRCOG.
Surgeon Lieutenant-Commander (D) A. N. Du Plessis, VRD, LDS. G. Paul, BDS, FDS.

THE ROYAL NAVY MEDICAL CLUB

The next annual general meeting of the Royal Navy Medical Club, to be followed by a committee meeting, will be held in the Medical Department of the Navy, Empress State Building, London, SW6, at 1430 on Wednesday, December 10, 1969. At this meeting a committee member to represent the Active List will be elected.

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